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CONTAMINATION ASSESSMENT REPORT ADDENDUM TRANSPORTATION MOTOR POOL BUILDING 80 NAS CECIL FIELD FL

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CONTAMINATION ASSESSMENT REPORT ADDENDUM

NAVAL AIR STATION CECIL FIELD TRANSPORTATION MOTOR POOL, BUILDING 80 JACKSONVILLE, FLORIDA

NAVY CLEAN - DISTRICT I CONTRACT NO. N62467-89-D-0317

JANUARY 1993

SOUTHERN DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
NORTH CHARLESTON, SOUTH CAROLINA
29419-9010

CONTAMINATION ASSESSMENT REPORT
ADDENDUM

NAVAL AIR STATION CECIL FIELD
TRANSPORTATION MOTOR POOL
BUILDING 80
JACKSONVILLE, FLORIDA

UIC: N60508

Contract No. N62467-89-D-0317

Prepared by:

ABB Environmental Services, Inc.
2590 Executive Center Circle, East
Tallahassee, Florida 32301

Author: Nicole Pagano

Prepared for:

Department of the Navy, Southern Division
Naval Facilities Engineering Command
2155 Eagle Drive
Charleston, South Carolina 29411-0068

Carl Loop, Code 1847, Engineer-in-Charge

January 1993

FOREWORD

Subtitle I of the Hazardous and Solid Waste Amendments (HSWA) of 1984 to the Solid Waste Disposal Act (SWDA) of 1965 established a national regulatory program for managing underground storage tanks (USTs) containing hazardous materials, especially petroleum products. Hazardous wastes stored in USTs were already regulated under the Resource Conservation and Recovery Act (RCRA) of 1976, which was also an amendment to SWDA. Subtitle I requires that the U.S. Environmental Protection Agency (USEPA) promulgate UST regulations. The program was designed to be administered by the individual States, who were allowed to develop more stringent standards, but not less stringent standards. Local governments were permitted to establish regulatory programs and standards that are more stringent, but not less stringent than either State or Federal regulations. The USEPA UST regulations are found in the Code of Federal Regulations, Title 40, Part 280 (Title 40 CFR 280) (*Technical Standards and Corrective Action Requirements for Owners and Operators of Underground Storage Tanks*) and Title 40 CFR 281 (*Approval of State Underground Storage Tank Programs*). Title 40 CFR 280 was revised and published on September 23, 1988, and became effective December 22, 1988.

The Navy's UST program policy is to comply with all Federal, State, and local regulations pertaining to USTs. This report was prepared to satisfy the requirements of the Florida Department of Environmental Regulation (FDER) Chapter 17-770, Florida Administrative Code (FAC) (*State Underground Petroleum Environmental Response*) regulations on petroleum contamination in Florida's environment as a result of petroleum spills or leaking tanks or piping.

Questions regarding this report should be addressed to the Environmental Coordinator, Naval Air Station (NAS) Cecil Field, Jacksonville, Florida, or to Southern Division, Naval Facilities Engineering Command (SOUTHNAVFACENGCOM), Code 18237, at DSN 563-0528 or 803-743-0528.

EXECUTIVE SUMMARY

At the request of the Navy, an additional field investigation was performed on December 17, 1992, to address comments and questions from Florida Department of Environmental Regulation (FDER) pertaining to the Contamination Assessment Report that was submitted to them in October 1992. To fulfill FDER requirements, an additional four soil borings were placed in the area of MP-6 to confirm or refute possible soil contamination discovered during the Preliminary Contamination Assessment. Also, four monitoring wells, CEF-180-02, CEF-180-03, CEF-180-04, CEF-180-05, were sampled for total and dissolved lead and chromium to confirm or refute possible metal contamination.

Findings

- Soil samples collected at the site did not contain detectable concentrations of petroleum hydrocarbons by organic vapor analyzer headspace techniques.
- Soil samples did not contain detectable concentrations of constituents from the gasoline analytical group in the area of MP-6.
- Filtered groundwater samples did not contain detectable concentrations of lead or chromium.
- Elevated concentrations of lead and chromium previously detected in samples collected June 1992 can be attributed to the presence of suspended sediments in the samples.

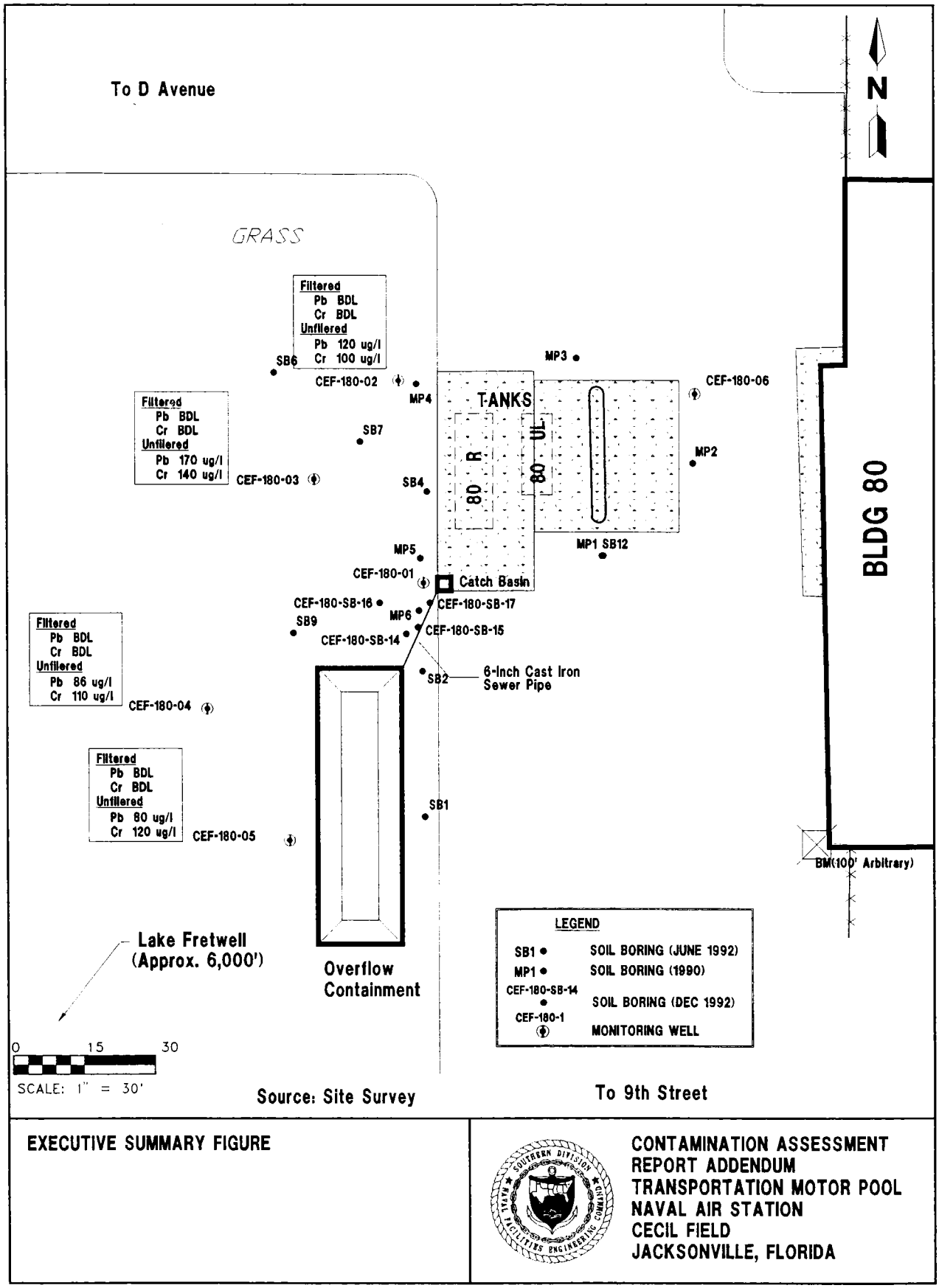
Conclusions

Based on the results of laboratory analysis, there is no evidence of groundwater contamination at the Transportation Motor Pool Site. Elevated concentrations of petroleum constituents in soil previously detected at the site could not be confirmed. Additional soil samples collected in the vicinity of the unconfirmed contaminated soil boring were below State regulatory standards.

Recommendations

Concentrations of petroleum constituents above State target levels were not detected at the Cecil Field Transportation Motor Pool Site. Therefore, ABB-ES recommends a No Further Action Proposal (NFAP) for this site.

FIG2-3



EXECUTIVE SUMMARY FIGURE

CONTAMINATION ASSESSMENT
REPORT ADDENDUM
TRANSPORTATION MOTOR POOL
NAVAL AIR STATION
CECIL FIELD
JACKSONVILLE, FLORIDA

ACKNOWLEDGMENTS

In preparing this report, the Underground Storage Tank Section of the Comprehensive Long-Term Environmental Action, Navy (CLEAN) Group at ABB Environmental Services, Inc. (ABB-ES), commends the support, assistance, and cooperation provided by the personnel at Naval Air Station (NAS) Cecil Field, Jacksonville, Florida, and Southern Division, Naval Facilities Engineering Command (SOUTHNAVFACENGCOM). In particular, we acknowledge the efforts and professionalism provided by the following people during the investigation and preparation of this report.

Name	Title	Position	Location
Carl Loop	Environmental Engineer	Engineer-in-Charge	SOUTHNAVFACENGCOM
William Raspet	Environmental Coordinator	Environmental Coordinator	NAS Cecil Field

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GLOSSARY

ABB-ES	ABB Environmental Services, Inc.
bls	below land surface
CA	contamination assessment
CAR	Contamination Assessment Report
CFR	Code of Federal Regulations
CLEAN	Comprehensive Long-Term Environmental Action, Navy
CompQAP	Comprehensive Quality Assurance Plan
FAC	Florida Administrative Code
FDER	Florida Department of Environmental Regulation
FID	flame ionization detector
HSWA	Hazardous and Solid Waste Amendments
mg/kg	milligrams per kilogram
MOP	Monitoring Only Plan
µg/kg	micrograms per kilogram
µg/ℓ	micrograms per liter
NAS	Naval Air Station
NFAP	No Further Action Plan
OVA	organic vapor analyzer
PAH	polynuclear aromatic hydrocarbons
PCA	preliminary contamination assessment
ppm	parts per million
QA/QC	Quality Assurance/Quality Control
RAP	Remedial Action Plan
RCRA	Resource Conservation and Recovery Act
SOUTHNAVFACENGCOM	Southern Division, Naval Facilities Engineering Command
SWDA	Solid Waste Disposal Act
TRPH	total recoverable petroleum hydrocarbons
USEPA	U.S. Environmental Protection Agency
USTs	underground storage tanks
VOA	volatile organic aromatics
VOCs	volatile organic compounds

1.0 INTRODUCTION

The Transportation Motor Pool, Building 80, is located at Naval Air Station (NAS) Cecil Field, Jacksonville, Florida. The base is situated in southwestern Duval County, at the junction of Highway 228 (Normandy Boulevard) and 103rd Street. The motor pool is located on the corner of 9th Street and D Avenue on the main base. There are two underground storage tanks (USTs) located west of Building 80. The tanks and pump island are designated Facility 180. Tank 80-R is a 10,000-gallon UST that was last reported to contain leaded gasoline and Tank 80-UL is a 5,000-gallon UST containing unleaded gasoline. The motor pool also dispenses diesel fuel from a small tanker truck near the tanks and pump island (Facility 180).

During a release detection program conducted at the site in October 1989, Tank 80-R was precision tested by AcuTest Corporation of Houston, Texas. The tank passed the test, but its associated piping failed. Further examination indicated that the product lines to the pumps were tight; therefore, it was concluded that the leak must be located in the vent pipe for the tank (Jordan, 1990). Tank 80-UL and its associated piping passed tank testing during the same program.

A preliminary contamination assessment (PCA) investigation was conducted by ABB Environmental Services, Inc. (ABB-ES), in December 1990. Soil samples collected during the investigation failed to produce a response on the organic vapor analyer (OVA). As part of the site soil sampling program, one soil sample was collected from four borings at the site and analyzed for polynuclear aromatic hydrocarbonn (PAH), lead, petroleum hydrocarbons. One sample, MP-6, contained concentrations in excess of Florida Department of Environmental Regulation (FDER) target levels. PAH was detected in excess of 61,000 micrograms per kilogram (μg/kg) and total recoverable petroleum hyrocarbon (TRPH) in excess of 300 miligrams/kilograms (mg/kg). Both exceed the clean soil standards established by FDER Chapter 17-775, Florida Administrative Code (FAC), of 6 mg/kg for PAH and 50 mg/kg TRPH.

A contamination assessment (CA) investigation was conducted by ABB-ES in June 1992. This assessment consisted of an intrusive investigation of soil borings and monitoring well installation. Soil borings were sampled and analyzed using OVA headspace techniques to detect the presence of petroleum hydrocarbons. No hydrocarbon contamination was detected in the soil at the motor pool site by this analysis method. Six shallow monitoring wells were installed and sampled during the CA. The groundwater samples were sent overnight to Wadsworth/ALERT Laboratories, Inc., Tampa, Florida, for analysis. Laboratory analyses of groundwater sampling did not indicate hydrocarbon contamination. Laboratory results indicated elebated concentrations of chromium and lead in unfiltered groundwater samples that exceeded drinking water standards.

ABB-ES was authorized by Southern Division, Naval Facilities Engineering Command (SOUTHNAVFACENGCOM) to conduct additional field investigations and develop an addendum to the Contamination Assessment Report (CAR) for the Transportation Motor Pool, Building 80, at Naval Air Station (NAS) Cecil Field in Jacksonville, Florida.

1.1 PURPOSE. The purpose of this addendum is to report the results of additional field investigations and incorporate responses to questions and comments from the Florida Department of Environmental Regulations (FDER) concerning the CAR submitted to FDER for the Transportation Motor Pool, Building 80, at NAS Cecil Field. This CAR was submitted in October 1992 to FDER for review. Upon completion of review, it was decided by FDER that additional field investigation at the site was necessary to support the No Further Action Plan (NFAP) recommended in the CAR. A copy of the correspondence from FDER to SOUTHNAVFACENGCOM and the responses of ABB-ES to these questions and comments are presented in Appendix A.

1.2 SCOPE. The scope of services developed to perform the additional field work included:

- drilling of four soil borings and collection of soil quality samples from the vadose zone for headspace analysis of volatile organic compounds (VOCs) using an organic vapor analyzer (OVA) to assess the extent of soil contamination at the site,
- collection of one soil sample from location MP-6 for laboratory analysis of gasoline analytical group parameters,
- collection of filtered and unfiltered groundwater samples for analysis of total and dissolved lead and chromium, and
- reduction and analysis of all data gathered during the field investigation to prepare this CAR addendum.

2.0 METHODOLOGIES AND EQUIPMENT

All methodologies and equipment used during the additional field investigation were in conformance with the ABB-ES, FDER approved, Comprehensive Quality Assurance Plan (CompQAP).

Appendix C in the Transportation Motor Pool Building 80 CAR (ABB-ES) describes all investigative methodologies and equipment that were employed during the additional field investigation.

2.1 SOIL BORING PROGRAM. During the Preliminary Contamination Assessment (PCA) and the Contamination Assessment (CA), 19 shallow soil borings were advanced to the water table. The borings were drilled to assess the approximate horizontal and vertical extent of soil contamination, evaluate suitable locations for installation of monitoring wells, and describe shallow lithology at the site.

On December 17, 1992, four additional soil borings, CEF-180-SB-14, CEF-180-SB-15, CEF-180-SB-16, and CEF-180-SB-17, were installed at the site to more accurately assess the area in the vicinity of MP-6 (Figure 2-1). Results of the soil boring program are discussed in Section 3.1 of this report. Complete lithologic logs for the additional four soil borings are presented in Appendix B, Lithologic Logs.

2.2 SAMPLING PROGRAM.

2.2.1 Soil Samples Soil samples collected during the December 1992 investigation were analyzed using an OVA equipped with a flame ionization detector (FID). One soil sample from boring CEF-180-SB-14 was sent to Wadsworth/ALERT Laboratories, in Tampa, Florida, for laboratory analyses for the FDER Chapter 17-770, Florida Administrative Code (FAC), gasoline analytical group, which includes U.S. Environmental Protection Agency (USEPA) Methods 8010 (chlorinated hydrocarbons), 8020 (non-halogenated volatile organic aromatics [VOA]), and 6010 (lead). Quality Assurance/Quality Control (QA/QC) samples were collected along with the soil samples. These samples included one trip blank, one equipment blank, and one duplicate sample. Results of the soil quality analyses are given in Section 3.1.

2.2.2 Groundwater Samples Groundwater samples were collected on December 17, 1992, from monitoring wells CEF-180-02, CEF-180-03, CEF-180-04, and CEF-180-05 (Figure 2-2). The appropriate number of trip blanks, equipment blanks, and duplicates were also collected. All groundwater quality assurance/quality control (QA/QC) samples were collected in accordance with the ABB-ES, FDER-approved CompQAP. All samples were shipped next day to Wadsworth/ALERT Laboratories, Inc., in Tampa, Florida, for analysis. The samples were analyzed for the total and dissolved lead and chromium by USEPA Methods 200.7 (dissolved lead), 239.2 (dissolved chromium), and 3050 (total lead and chromium).

FIG2-3

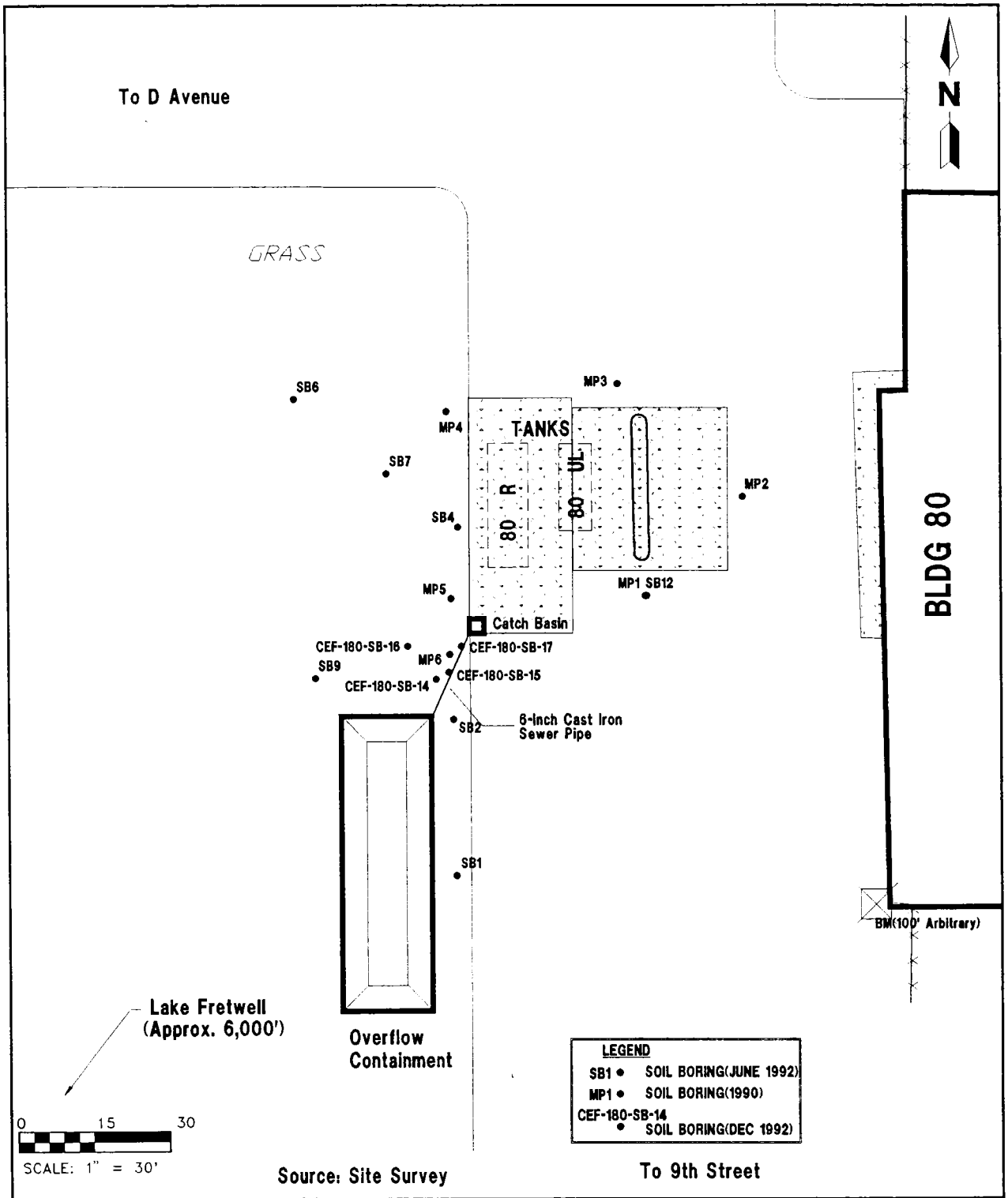


FIGURE 2-1
SOIL BORING LOCATION MAP

CONTAMINATION ASSESSMENT REPORT ADDENDUM
TRANSPORTATION MOTOR POOL
NAVAL AIR STATION
CECIL FIELD
JACKSONVILLE, FLORIDA

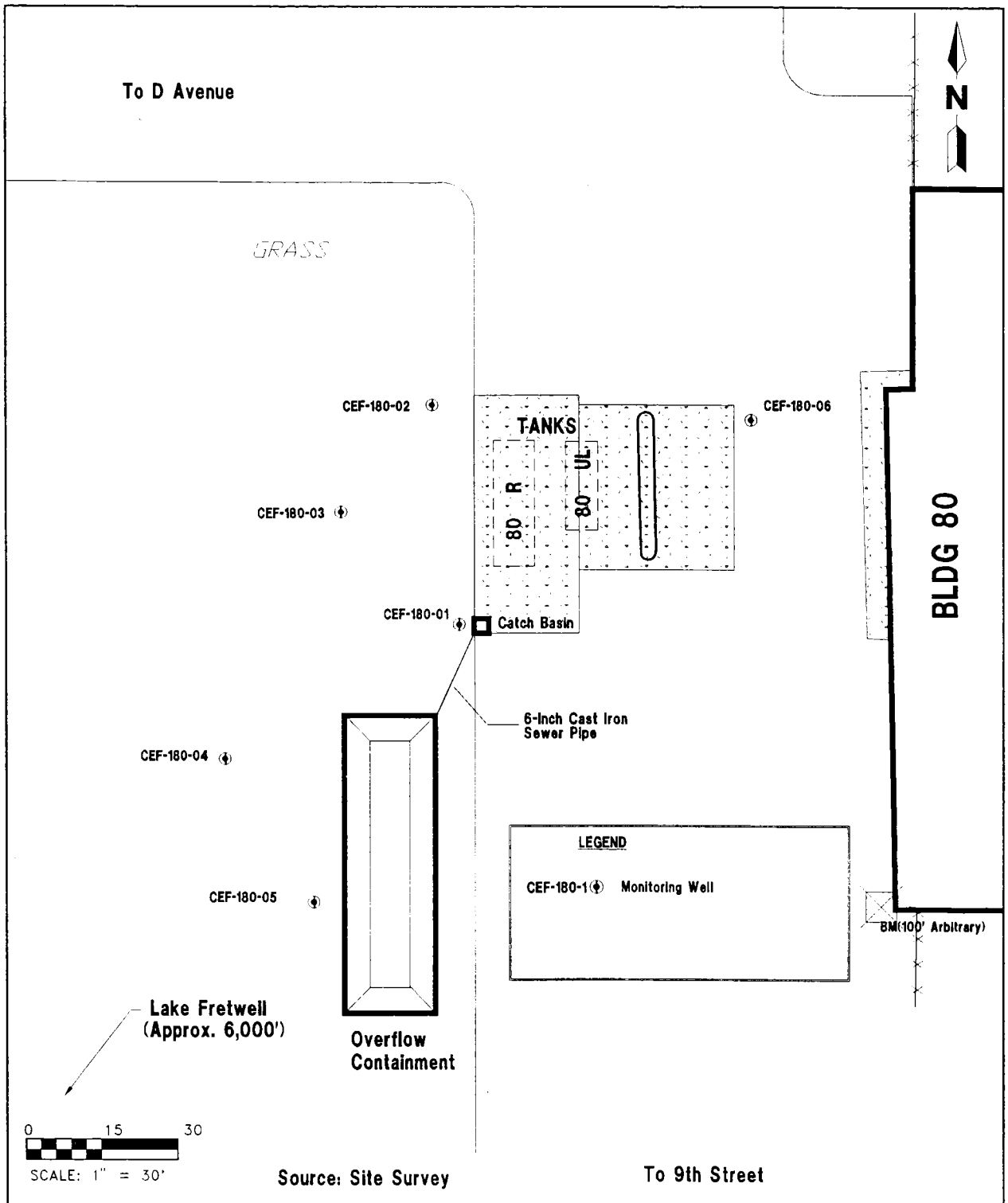


FIGURE 2-2
MONITORING WELL LOCATION MAP

CONTAMINATION ASSESSMENT REPORT ADDENDUM
TRANSPORTATION MOTOR POOL
NAVAL AIR STATION
CECIL FIELD
JACKSONVILLE, FLORIDA

3.0 CONTAMINATION ASSESSMENT RESULTS

3.1 SOIL QUALITY ASSESSMENT. During the PCA and the CA, 19 soil borings were completed. These borings were sampled for OVA headspace analyses. Of those, MP-4, CEF-180-SB-3, and CEF-180-SB-4, showed a positive result. The results were 1 part per million (ppm), 4 ppm, and 2 ppm, respectively, all of which are below the regulatory clean soil criteria of 50 ppm.

As part of the additional field investigation for the CA, four soil borings were installed around MP-6 to more accurately assess possible soil contamination in this area. These borings were sampled at depths of 1½-foot and 3-foot intervals for OVA headspace analyses. Results of OVA analyses did not indicate concentraitons of petroleum hydrocarbons above background levels in the four borings.

In addition to OVA headspace analyses, one soil sample was collected from soil boring CEF-180-SB-14 at 3 feet below land surface (bls) and analyzed for gasoline analytical group constituents per FDER Chapter 17-770, FAC. Results of laboratory analysis of gasoline analytical group constituents in this soil sample were below method detection limits.

Dichloromethane was detected in the soil samples, CEF-180-SB-14 and Duplicate, and the laboratory blank at 190 micrograms per kilogram (µg/kg), 35 µg/kg, and 3 µg/kg, respectively. Due to the elevated concentrations of dichloromethane in the sample from CEF-180-SB-14, and suspicion that dichloromethane was a laboratory contaminant, the soil sample was reanalyzed. Upon reanalysis, the dichloromethane concentration was 10 µg/kg and, subsequently, deemed a laboratory contaminant. Documentation of dichloromethane analysis is included with the analytical data in Appendix C.

3.2 GROUNDWATER QUALITY ASSESSMENT. Laboratory analytical results of groundwater samples collected December 17, 1992, are shown in Table 3-1.

Table 3-1
Laboratory Results from Groundwater Sampling Event, December 17, 1992

Contamination Assessment Report Addendum
Transportation Motor Pool, Building 80
NAS Cecil Field, Jacksonville, Florida

Monitoring Well Number	Total Lead (µg/ℓ)	Dissolved Lead (µg/ℓ)	Total Chromium (µg/ℓ)	Dissolved Chromium (µg/ℓ)
CEF-180-02	120	ND	100	ND
CEF-180-03	170	ND	140	ND
CEF-180-03	200	ND	120	ND
CEF-180-04	86	ND	110	ND
CEF-180-05	80	ND	120	ND

Note: µg/ℓ = micrograms per liter.

These results indicate that the source of lead and chromium in the groundwater samples can be attributed to suspended sediments. Lead and chromium were not detected in the filtered groundwater samples (Figure 3-1). Laboratory analytical data are included as Appendix C, Analytical Data.

FIG2-3

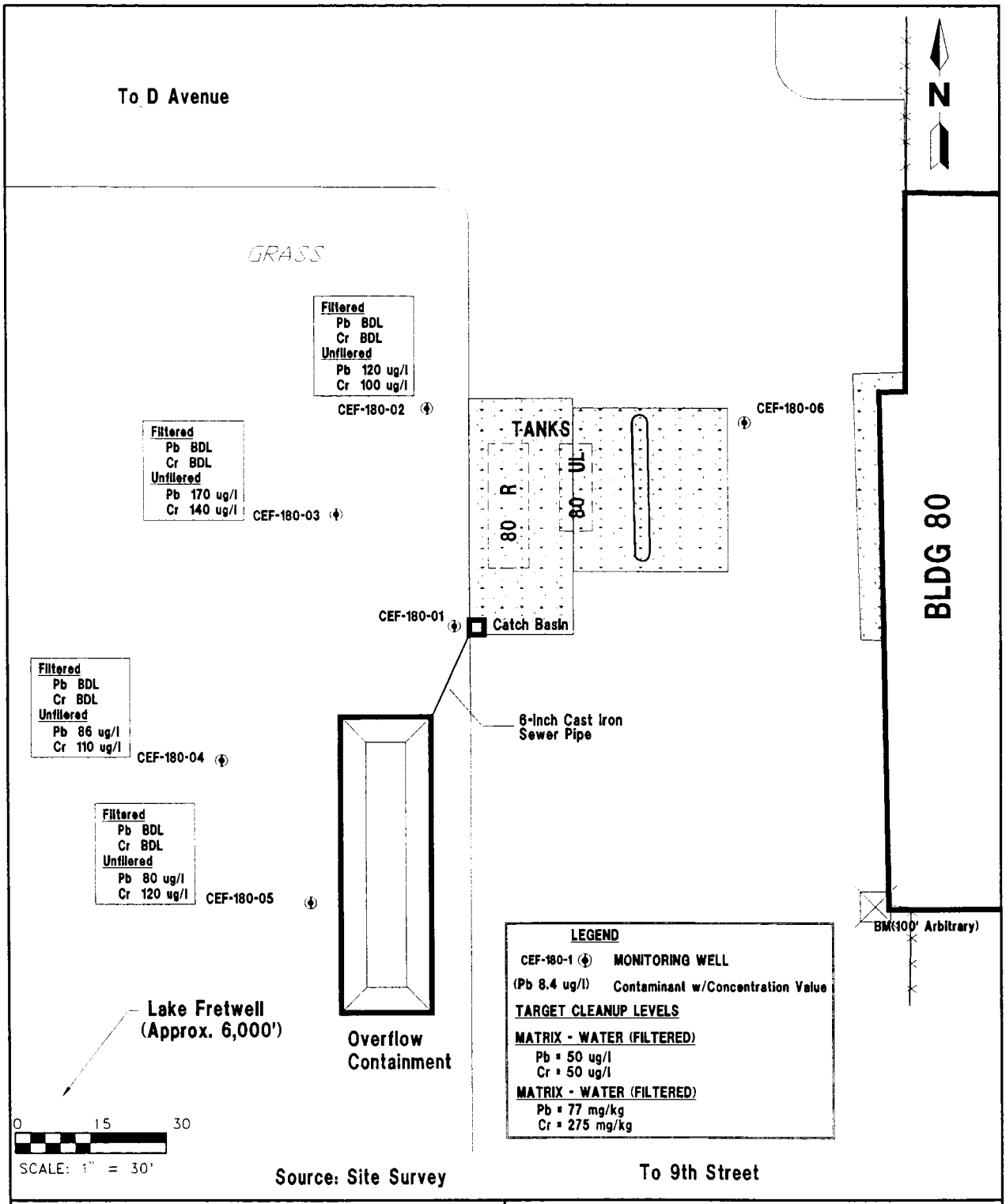


FIGURE 3-1
GROUNDWATER ANALYTICAL RESULTS MAP
DECEMBER 17, 1992

CONTAMINATION ASSESSMENT REPORT ADDENDUM
TRANSPORTATION MOTOR POOL
NAVAL AIR STATION
CECIL FIELD
JACKSONVILLE, FLORIDA

4.0 SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

4.1 **SUMMARY**. Based upon the PCA, the CA, additional field investigation, and the laboratory analytical results, the following is a summary of the conditions observed at the site.

- OVA headspace analyses of subsurface sediments indicated no excessively contaminated soils (VOC concentrations above 50 ppm).

- Results of laboratory analyses of the subsurface sample did not indicate petroleum contamination at boring location CEF-180-14, near boring location MP-6.

- Lead and chromium were detected in all unfiltered groundwater samples. Lead concentrations in unfiltered groundwater samples ranged from 80 $\mu g/\ell$ to 200 $\mu g/\ell$; chromium concentrations ranged from 100 $\mu g/\ell$ to 140 $\mu g/\ell$.

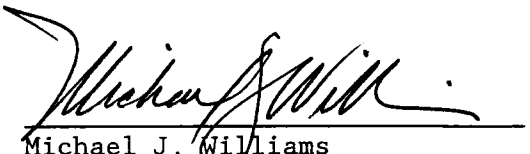
- Concentrations of lead and chromium in filtered groundwater samples were below method detection limits.

4.2 **CONCLUSIONS**. The PCA, the CA, and the additional field investigation at the Transportation Motor Pool site at NAS Cecil Field, indicates elevated lead and chromium concentrations detected in the groundwater samples from monitoring wells CEF-180-02, CEF-180-03, CEF-180-04, and CEF-180-05 were associated with suspended sediments.

4.3 **RECOMMENDATIONS**. Petroleum-related groundwater contamination was not encountered at the site. Furthermore, the soil contamination identified during the PCA was unconfirmed and appears to be isolated. Therefore, ABB-ES recommends a NFAP for this site.

5.0 PROFESSIONAL REVIEW CERTIFICATION

The contamination assessment contained in this report was prepared using sound hydrogeologic principles and judgment. This assessment is based on the geologic investigation and associated information detailed in the text and appended to this report. If conditions are determined to exist that differ from those described, the undersigned geologist should be notified to evaluate the effects of any additional information on the assessment described in this report. This Contamination Assessment Report Addendum was developed for Transportation Motor Pool, Building 80 at the NAS Cecil Field in Jacksonville, Florida, and should not be construed to apply to any other site.



Michael J. Williams
Professional Geologist
P.G. No. 000344

1/19/93
Date

6.0 REFERENCES

ABB Environmental Services, Inc., 1992, Contamination Assessment Report, Transportation Motor Pool, Building 80, NAS Cecil field, Jacksonville, Florida: Prepared for Southern Division, Naval Facilities Engineering Command, Charleston, South Carolina.

E.C. Jordan Company, 1990, Final Report, Release Detection Program for Underground Storage Tanks at NAS Cecil Field, Jacksonville, Florida: Prepared for Southern Division, Naval Facilities Engineering Command, Charleston, South Carolina.

APPENDIX A

FDER/SOUTHNAVFACENGCOM Correspondence

RESPONSE TO FLORIDA DEPARTMENT OF ENVIRONMENT REGULATION (FDER) COMMENTS

COMMENT 1: Please submit a copy of the tank and line tightness tests performed in accordance with Chapter 17-761, FAC, to establish the structural integrity of the current product storage/distribution system.

RESPONSE: On October 21, 1989, AcuTest Corporation completed a precision test on the tanks at the Motor Pool site. This report is included as Appendix D, Precision Test.

COMMENT 2: Lead and chromium concentration exceed Florida Ground Water Guidance Concentration in wells CEF-180-02, 03, 04, and 05. These wells should be resampled trying to obtain sediment free groundwater and analyzed for lead and chromium (total and dissolved). If metal contamination is confirmed, then supplemental assessment (including additional monitoring wells) should be performed to determine the source, degree and extent of the metals.

RESPONSE: It was suspected that the elevated concentrations of lead and chromium in the water samples taken from monitoring wells CEF-180-02, 03, 04, and 05 on August 5, 1992, were due to suspended sediments. Filtered and unfiltered groundwater samples were collected from each of these wells on December 17, 1992, and analyzed for total and dissolved lead and chromium. The samples were sent overnight to Wadsworth/ALERT Laboratories in Tampa, Florida, for analysis. The results of the analysis is presented in Table 1.

Table 1

Monitoring Well Number	Total Lead ($\mu g/\ell$)	Dissolved Lead ($\mu g/\ell$)	Total Chromium ($\mu g/\ell$)	Dissolved Chromium ($\mu g/\ell$)
CEF-180-02	120	ND	100	ND
CEF-180-03	170	ND	140	ND
CEF-180-03 DUPLICATE	200	ND	120	ND
CEF-180-04	86	ND	110	ND
CEF-180-05	80	ND	120	ND

Note: $\mu g/\ell$ = micrograms per liter.

These results indicate that the suspended sediments are the source of lead and chromium in the groundwater samples. Concentrations of lead and chromium in the suspended sediments are below State regulatory standard for soil of 77 milligrams per kilogram (mg/kg) for lead and 275 mg/kg for chromium. Lead and chromium concentrations in the filtered groundwater samples were below detection limits. Laboratory analytical data is included in Appendix C, Analytical Data.

COMMENT 3: Resample the soil at the MP-6 location. A representative sample should be collected for lab analysis based on OVA testing at this location. If soil contamination is confirmed, then a monitoring well should be installed at this location, and sampled for the Gasoline Analytical Group parameters.

RESPONSE: On December 17, 1992, four additional soil borings were each completed to 3 feet below land surface (bls) sampled for volatile organics. Soil boring locations are shown in Figure 2-1 in the body of the CAR Addendum . Headspace analysis was performed using an organic vapor analyzer equipped with a flame ionizer detector. Lithologic descriptions of sediments at each boring were noted. Lithologic logs are included in Appendix B, Lithologic Logs.

Soil boring CEF-MP-SB-14 was placed in the same location as MP-6, and one soil sample was collected at a depth of 3 feet bls for analysis of gasoline analytical group parameters. Laboratory analyses did not detect gasoline analytical group constituents in the soil sample.

Dichloromethane was detected in both the soil samples, CEF-180-SB-14 and Duplicate, and the laboratory blank at 190 micrograms per kilogram (μg/kg), 35 μg/kg, and 3 μg/kg, respectively. Due to the elevated concentrations of dichloromethane in the sample from CEF-180-SB-14, and the belief that this was a laboratory contaminant, the soil sample was reanalyzed. Upon reanalysis, the dichloromethane concentration was 10 μg/kg and subsequently deemed a laboratory contaminant. Documentation of this is included with the analytical data in Appendix C.

COMMENT 4: A Monitoring Only Plan (MOP) or No Further Action Plan (NFAP) should be submitted if the resampling indicates that "monitoring only" or "no further action" are appropriate, otherwise a Remedial Action Plan (RAP) will be required following FDER approval of the necessary supplemental assessment.

RESPONSE: Petroleum-related groundwater contamination was not encountered at the site. Furthermore, the soil contamination identified during the preliminary contamination assessment (PCA) appears to be isolated. ABB-ES recommends a NFAP for this site.

COMMENT 5: If remedial action is required, aquifer characteristics (hydraulic conductivity, transmissivity, etc.) of the contaminated aquifer, the hydraulic gradient across the site, and the estimated rate of groundwater flow must be determined. Slug tests should be performed on three representative monitoring wells to aid in determining an average hydraulic conductivity across the subject site.

RESPONSE: Aquifer characteristics were not assessed because the site does not require remedial action.

C. Russell
J. Williams
A. Stamp
file (orig)
C+D 11/24/92

Florida Department of Environmental Regulation

Twin Towers Office Bldg. • 2600 Blair Stone Road • Tallahassee, Florida 32399-2400

Lawton Chiles, Governor

Carol M. Browner, Secretary

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To [redacted]	From C. Loop
Co. ABB	Co. SOUTHDIV UST
Dept.	Phone # 803-743-0528
Fax # 904-656-3386	Fax #

November 19, 1992

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

Mr. Carl Loop
Code 18237
Department of the Navy
Southern Division
Naval Facilities Engineering Command
2155 Eagle Drive
Post Office Box 10068
Charleston, South Carolina

Dear Mr. Loop:

Department personnel have completed the technical review of the Contaminated Assessment Report for the Transportation Motor Pool Building 80, NAS Cecil Field. I have enclosed a memorandum addressed to me from Mr. Michael Deliz. It documents our comments on the referenced report.

If I can be of any further assistance with this matter, please contact me at 904/488-0190.

Sincerely,

Eric S. Nuzie

Eric S. Nuzie
Federal Facilities Coordinator

ESN/bb

Enclosure

cc: Michael Deliz
Brian Cheary
Lynn Griffin
John Mitchell
Jerry Young
Allison Drew
John Dingwall
Basit Ghori

23 Nov 92

Peter,
Please get tightness tests from activity + provide & sample soil & wells
Carl

State of Florida
DEPARTMENT OF ENVIRONMENTAL REGULATION

For Routing To Other Than The Addressee
To: Location
To: Location
To: Location
From: Date

Interoffice Memorandum

TO: Eric S. Nuzie, Federal Facilities Coordinator
Bureau of Waste Cleanup

THROUGH: Dr. James J. Crane, P.G. III/Administrator
Technical Review Section djc

Tim J. Bahr, Professional Geologist II
Technical Review Section B

FROM: Michael J. Deliz, Environmental Specialist II
Technical Review Section mjd

DATE: November 12, 1992

SUBJECT: Contamination Assessment Report - dated, October 1992
Naval Air Station, Cecil Field - Transportation Motor Pool Building 80

The Bureau of Waste Cleanup has reviewed the Contamination Assessment Report (CAR) dated October 1992 (received October 16, 1992). In order to meet the requirements of Chapter 17-770, Florida Administrative Code (F.A.C.), the following comments need to be addressed:

1. Please submit a copy of the tank and line tightness tests performed in accordance with Chapter 17-761, F.A.C., to establish the structural integrity of the current product storage/distribution system. Tests: Oct '89 by Acutest

2. Lead and chromium concentrations exceed Florida Ground Water Guidance Concentrations in wells: CEF-18C-02; 03; 04; and 05. These wells should be resampled trying to obtain sediment free groundwater and analyzed for lead and chromium (total and dissolved). If metal contamination is confirmed, then supplemental assessment (including additional monitoring wells) should be performed to determine the source, degree and extent of the metals.

2. Resample the soil at the MP-6 location. A representative sample should be collected for lab analysis based on OVA testing at this location. If soil contamination is confirmed, then a monitioring well should be installed at this location, and sampled for the Gascline Analytical Group parameters.

3. A MOP or NFAP should be submitted if the resampling indicates that "monitoring only" or "no further action" are appropriate, otherwise a Remedial Action Plan (RAP) will be required following DER approval of the necessary supplemental assessment.

4. If remedial action is required, aquifer characteristics (hydraulic conductivity, transmissivity, etc.) of the contaminated aquifer, the hydraulic gradient across the site, and the estimated rate of groundwater flow must be determined. Slug tests should be performed on three representative monitoring wells to aid in determining an average hydraulic conductivity across the subject site.

/mjd

APPENDIX B

Lithologic Logs

TITLE: NAS Cecil Field	LOG of WELL:		BORING NO. CEF-180-SB14
CLIENT: SOUTHNAVFACENGCOM			PROJECT NO: 7544-40
CONTRACTOR: GPI		DATE STARTED: 12/17/92	COMPLTD: 12/17/92
METHOD: Hand auger	CASE SIZE:	SCREEN INT.:	PROTECTION LEVEL: D
TOC ELEV.: FT.	MONITOR INST.: OVA	TOT DPTH: 2.5FT.	DPTH TO ▽ FT.
LOGGED BY: N. Pagano	WELL DEVELOPMENT DATE:		SITE: Transportation Motor Pool

DEPTH FT.	LABORATORY SAMPLE ID.	SAMPLE	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
				0	Sand, fine-grained, well sorted.		SP		
				0	Brown, silty sand, very fine- to fine-grained.		SM		
				0	Light brown to brown silty sand, very fine- to fine-grained.				
5									
10									

 ABB ENVIRONMENTAL SERVICES, INC.

TITLE: NAS Cecil Field	LOG of WELL:		BORING NO. CEF-180-SB15
CLIENT: SOUTHNAVFACENGCOM			PROJECT NO: 7544-40
CONTRACTOR: GPI		DATE STARTED: 12/17/92	COMPLTD: 12/17/92
METHOD: Hand auger	CASE SIZE:	SCREEN INT.:	PROTECTION LEVEL: D
TOC ELEV.: FT.	MONITOR INST.: OVA	TOT DPTH: 2.0FT.	DPTH TO ▽ FT.
LOGGED BY: P. Wagner	WELL DEVELOPMENT DATE:		SITE: Transportation Motor Pool

DEPTH FT.	LABORATORY SAMPLE ID.	SAMPLE	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
				0	Mottled black and gray sand, very fine- to fine-grained, poorly sorted		SP		
					Met refusal at 2.0 feet.				
5									
10									

 ABB ENVIRONMENTAL SERVICES, INC.

TITLE: NAS Cecil Field	**LOG of WELL:**	**BORING NO.** CEF-180-SB16
CLIENT: SOUTHNAVFACENGCOM		**PROJECT NO:** 7544-40
CONTRACTOR: GPI	**DATE STARTED:** 12/17/92	**COMPLTD:** 12/17/92
METHOD: Hand auger	**CASE SIZE:** **SCREEN INT.:**	**PROTECTION LEVEL:** D
TOC ELEV.: FT.	**MONITOR INST.:** OVA **TOT DPTH:** 3.0FT.	**DPTH TO ▽** FT.
LOGGED BY: P. Wagner	**WELL DEVELOPMENT DATE:**	**SITE:** Transportation Motor Pool

DEPTH FT.	LABORATORY SAMPLE ID.	SAMPLE	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
				0	Light gray sand, fine-grained, well sorted.		SP		
				0	Medium brown sand, fine-grained with ~10% silt, moderately well sorted		SM		
5									
10									

 ABB ENVIRONMENTAL SERVICES, INC.

TITLE: NAS Cecil Field	LOG of WELL:		BORING NO. CEF-180-SB17
CLIENT: SOUTHNAVFACENGCOM			PROJECT NO: 7544-40
CONTRACTOR: GPI		DATE STARTED: 12/17/92	COMPLTD: 12/17/92
METHOD: Hand auger	CASE SIZE:	SCREEN INT.:	PROTECTION LEVEL: D
TOC ELEV.: FT.	MONITOR INST.: OVA	TOT DPTH: 3.0FT.	DPTH TO ▽ FT.
LOGGED BY: P. Wagner	WELL DEVELOPMENT DATE:		SITE: Transportation Motor Pool

DEPTH FT.	LABORATORY SAMPLE ID.	SAMPLE	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
				0	Pale gray sand, fine-grained, well sorted.		SP		
				0	Tan sand, very fine- to fine-grained sand with ~5% silt, moderately well sorted.				
5									
10									

 ABB ENVIRONMENTAL SERVICES, INC.

APPENDIX C

Analytical Data

WADSWORTH/ ALERT Laboratories
Division of Enseco Incorporated

5910 Breckenridge Parkway, Suite H
Tampa, FL 33610

813-621-0784
FAX 813-623-6021

ANALYTICAL REPORT

SUBCONTRACT NUMBER: 1-08-134

CECIL FIELD MOTOR POOL

Presented to:

PETER REDFERN

ABB ENVIRONMENTAL SERVICES, INC.

WADSWORTH/ALERT LABORATORIES

5910 BRECKENRIDGE PARKWAY, SUITE H

TAMPA, FL 33610

(813) 621-0784

Dan Henson
Project Manager

Randall C. Grubbs
Laboratory Director - Florida

January 4, 1993

INVOLVEMENT

This report summarizes the analytical results of the Cecil Field Motor Pool site submitted by ABB Environmental Services, Inc. to Wadsworth/ALERT Laboratories who provided independent, analytical services for this project under the direction of Peter Redfern. The samples were accepted into Wadsworth's Florida facility on 18 December 1992, in accordance with documented sample acceptance procedures. The associated analytical methods and sample results are outlined sequentially in this report.

Analytical results included in this report have been reviewed for compliance with the Laboratory QA/QC Plan as summarized in the Quality Control Section at the rear of the report. Sample custody documentation describing the number of samples and sample matrices is also included. Any qualifications and/or non-compliant items have been noted below.

WADSWORTH/ ALERT Laboratories

ANALYTICAL METHODS

Wadsworth/ALERT Laboratories utilizes only USEPA approved analytical methods and instrumentation. The analytical methods utilized for the analysis of these samples are listed below.

PARAMETER	METHOD	
ORGANICS		
Volatile Organics	** EPA Method 601/2	** SW846 Method 8010/20
Extraction		** SW846 Method 5030
METALS		
Chromium	** EPA Method 200.7	
Lead	** EPA Method 239.2	** SW846 Method 6010
Digestion		** SW846 Method 3050

NOTE:	** Indicates usage of this method to obtain results for this report.
(D)	Indicates draft version of this method was used
EPA Methods	Methods for Chemical Analysis of Water and Wastes, USEPA, 600/4-79-020, March, 1983. July, 1982 Drinking Waters USEPA, 600/4-88/039, December, 1988.
Std. Methods	Standard Methods for the Examination of Water and Waste-water, APHA, 16th edition, 1985.
USEPA Methods	From 40CFR Part 136, published in Federal Register on October 26, 1984.
SW-846 Methods	Test Methods for Evaluating Solid Waste Physical/Chemical Methods, 3rd Edition, USEPA, 1986.
ASTM Methods	American Society for Testing and Materials.
NIOSH Method	NIOSH Manual of Analytical Methods, National Institute for Occupational Safety and Health, 2nd Edition, April 1977.

WADSWORTH/ Laboratories

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB # 2L1804-1
MATRIX: WATER

DATE RECEIVED: 12/18/92
DATE EXTRACTED: NA
DATE ANALYZED: 12/29/92

SAMPLE ID: EB-S-1

PROJ #07544.30

CERTIFICATION #: E84059
HRS84297

VOLATILE ORGANICS
METHOD 601/602 - GC

Benzene	ND	1,2-Dichloroethane	ND
Bromodichloromethane	ND	1,1-Dichloroethene	ND
Bromoform	ND	1,2-Dichloroethene (Total)	ND
Bromomethane	ND	1,2-Dichloropropane	ND
Carbon tetrachloride	ND	cis-1,3-Dichloropropene	ND
Chlorobenzene	ND	trans-1,3-Dichloropropene	ND
Chloroethane	ND	Ethylbenzene	ND
2-Chloroethylvinyl ether	ND	Methylene chloride	ND
Chloroform	ND	1,1,2,2-Tetrachloroethane	ND
Chloromethane	ND	Tetrachloroethene	ND
Dibromochloromethane	ND	Toluene	ND
1,2-Dichlorobenzene	ND	1,1,1-Trichloroethane	ND
1,3-Dichlorobenzene	ND	1,1,2-Trichloroethane	ND
1,4-Dichlorobenzene	ND	Trichloroethene	ND
Dichlorodifluoromethane	ND	Trichlorofluoromethane	ND
1,1-Dichloroethane	ND	Vinyl chloride	ND
		Xylenes	ND
		Methyl-tert-butylether	ND

NOTE: ND (None Detected, lower detectable limit = 1 ug/L) as rec'd
ND* (None Detected, lower detectable limit = ug/L) as rec'd
-- (Not Analyzed)

SURROGATE RECOVERY:	%	ACCEPTABLE LIMITS
Bromochloromethane (HECD)	80	(78-122)
Trifluorotoluene (PID)	98	(73-131)

WADSWORTH/ ALERT Laboratories

COMPANY : ABB ENVIRONMENTAL SERVICES, INC. DATE RECEIVED: 12/18/92
LAB #: 2L1804-1
MATRIX : WATER

SAMPLE ID : EB-S-1 PROJ #07544.30

CERTIFICATION #: E84059
HRS84297

METALS ANALYTICAL REPORT
SELECTED LIST

Total metals analysis results - as received

ELEMENT	PREPARATION - ANALYSIS DATE	RESULT	DETECTION LIMIT	
Lead	12/23/92	ND	5	ug/L

NOTE: ND (None Detected)

WADSWORTH/ALERT Laboratories

COMPANY : ABB ENVIRONMENTAL SERVICES, INC. DATE RECEIVED: 12/18/92
LAB #: 2L1804-2
MATRIX : WATER

SAMPLE ID : EB-W-1 PROJ #07544.30

CERTIFICATION #: E84059
HRS84297

METALS ANALYTICAL REPORT
SELECTED LIST

Total metals analysis results - as received

ELEMENT	PREPARATION - ANALYSIS DATE	RESULT	DETECTION LIMIT	
Chromium	12/23/92	ND	50	ug/L
Lead	12/23/92	ND	5	ug/L

NOTE: ND (None Detected)

WADSWORTH/ ...EST Laboratories

COMPANY : ABB ENVIRONMENTAL SERVICES, INC. DATE RECEIVED: 12/18/92
LAB #: 2L1804-2
MATRIX : WATER

SAMPLE ID : EB-W-1 PROJ #07544.30

CERTIFICATION #: E84059
HRS84297

METALS ANALYTICAL REPORT
SELECTED LIST

Dissolved metals analysis results

ELEMENT	PREPARATION - ANALYSIS DATE	RESULT	DETECTION LIMIT	
Chromium	12/21-12/22/92	ND	50	ug/L
Lead	12/21/92	ND	5	ug/L

NOTE: ND (None Detected) as rec'd

WADSWORTH/ ALERT Laboratories

COMPANY : ABB ENVIRONMENTAL SERVICES, INC. DATE RECEIVED: 12/18/92
LAB #: 2L1804-3
MATRIX : WATER

SAMPLE ID : CEF-180-DUP-2 PROJ #07544.30

CERTIFICATION #: E84059
HRS84297

METALS ANALYTICAL REPORT
SELECTED LIST

Total metals analysis results - as received

ELEMENT	PREPARATION - ANALYSIS DATE	RESULT	DETECTION LIMIT	
Chromium	12/23/92	120	50	ug/L
Lead	12/23/92	200	40	ug/L

NOTE: ND (None Detected)

WADSWORTH/ [illegible] Laboratories

COMPANY : ABB ENVIRONMENTAL SERVICES, INC. DATE RECEIVED: 12/18/92
LAB #: 2L1804-3
MATRIX : WATER

SAMPLE ID : CEF-180-DUP-2 PROJ #07544.30

CERTIFICATION #: E84059
HRS84297

METALS ANALYTICAL REPORT
SELECTED LIST

Dissolved metals analysis results

ELEMENT	PREPARATION - ANALYSIS DATE	RESULT	DETECTION LIMIT	
Chromium	12/21-12/22/92	ND	50	ug/L
Lead	12/21/92	ND	5	ug/L

NOTE: ND (None Detected) as rec'd

WADSWORTH/ ALBANY Laboratories

COMPANY : ABB ENVIRONMENTAL SERVICES, INC. DATE RECEIVED: 12/18/92
LAB #: 2L1804-4
MATRIX : WATER

SAMPLE ID : CEF-180-2 PROJ #07544.30

CERTIFICATION #: E84059
HRS84297

METALS ANALYTICAL REPORT
SELECTED LIST

Total metals analysis results - as received

ELEMENT	PREPARATION - ANALYSIS DATE	RESULT	DETECTION LIMIT	
Chromium	12/23/92	100	50	ug/L
Lead	12/23/92	120	20	ug/L

NOTE: ND (None Detected)

WADSWORTH/ [illegible] Laboratories

COMPANY : ABB ENVIRONMENTAL SERVICES, INC.
LAB #: 2L1804-4
MATRIX : WATER

DATE RECEIVED: 12/18/92

SAMPLE ID : CEF-180-2

PROJ #07544.30

CERTIFICATION #: E84059
HRS84297

METALS ANALYTICAL REPORT
SELECTED LIST

Dissolved metals analysis results

ELEMENT	PREPARATION - ANALYSIS DATE	RESULT	DETECTION LIMIT	
Chromium	12/21-12/22/92	ND	50	ug/L
Lead	12/21/92	ND	5	ug/L

NOTE: ND (None Detected) as rec'd

WADSWORTH/ Laboratories

COMPANY : ABB ENVIRONMENTAL SERVICES, INC. DATE RECEIVED: 12/18/92
LAB #: 2L1804-5
MATRIX : WATER

SAMPLE ID : CEF-180-4 PROJ #07544.30

CERTIFICATION #: E84059
HRS84297

METALS ANALYTICAL REPORT
SELECTED LIST

Total metals analysis results - as received

ELEMENT	PREPARATION - ANALYSIS DATE	RESULT	DETECTION LIMIT	
Chromium	12/23/92	110	50	ug/L
Lead	12/23/92	86	20	ug/L

NOTE: ND (None Detected)

WADSWORTH/ Laboratories

COMPANY : ABB ENVIRONMENTAL SERVICES, INC. DATE RECEIVED: 12/18/92
LAB #: 2L1804-5
MATRIX : WATER

SAMPLE ID : CEF-180-4 PROJ #07544.30

CERTIFICATION #: E84059
HRS84297

METALS ANALYTICAL REPORT
SELECTED LIST

Dissolved metals analysis results

ELEMENT	PREPARATION - ANALYSIS DATE	RESULT	DETECTION LIMIT	
Chromium	12/21-12/22/92	ND	50	ug/L
Lead	12/21/92	ND	5	ug/L

NOTE: ND (None Detected) as rec'd

WADSWORTH/ Laboratories

COMPANY : ABB ENVIRONMENTAL SERVICES, INC.
LAB #: 2L1804-6
MATRIX : WATER

DATE RECEIVED: 12/18/92

SAMPLE ID : CEF-180-3

PROJ #07544.30

CERTIFICATION #: E84059
HRS84297

METALS ANALYTICAL REPORT
SELECTED LIST

Total metals analysis results - as received

ELEMENT	PREPARATION - ANALYSIS DATE	RESULT	DETECTION LIMIT	
Chromium	12/23/92	140	50	ug/L
Lead	12/23/92	170	20	ug/L

NOTE: ND (None Detected)

WADSWORTH/ Laboratories

COMPANY : ABB ENVIRONMENTAL SERVICES, INC. DATE RECEIVED: 12/18/92
LAB #: 2L1804-6
MATRIX : WATER

SAMPLE ID : CEF-180-3 PROJ #07544.30

CERTIFICATION #: E84059
HRS84297

METALS ANALYTICAL REPORT
SELECTED LIST

Dissolved metals analysis results

ELEMENT	PREPARATION - ANALYSIS DATE	RESULT	DETECTION LIMIT	
Chromium	12/21-12/22/92	ND	50	ug/L
Lead	12/21/92	ND	5	ug/L

NOTE: ND (None Detected) as rec'd

WADSWORTH/ Laboratories

COMPANY : ABB ENVIRONMENTAL SERVICES, INC. DATE RECEIVED: 12/18/92
LAB #: 2L1804-7
MATRIX : WATER

SAMPLE ID : CEF-180-5 PROJ #07544.30

CERTIFICATION #: E84059
HRS84297

METALS ANALYTICAL REPORT
SELECTED LIST

Total metals analysis results - as received

ELEMENT	PREPARATION - ANALYSIS DATE	RESULT	DETECTION LIMIT	
Chromium	12/23/92	120	50	ug/L
Lead	12/23/92	80	20	ug/L

NOTE: ND (None Detected)

WADSWORTH/ [illegible] Laboratories

COMPANY : ABB ENVIRONMENTAL SERVICES, INC. DATE RECEIVED: 12/18/92
LAB #: 2L1804-7
MATRIX : WATER

SAMPLE ID : CEF-180-5 PROJ #07544.30

CERTIFICATION #: E84059
HRS84297

METALS ANALYTICAL REPORT
SELECTED LIST

Dissolved metals analysis results

ELEMENT	PREPARATION - ANALYSIS DATE	RESULT	DETECTION LIMIT	
Chromium	12/21-12/22/92	ND	50	ug/L
Lead	12/21/92	ND	5	ug/L

NOTE: ND (None Detected) as rec'd

WADSWORTH/ ERT Laboratories

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB #: 2L1804-8
MATRIX: SOIL

DATE RECEIVED: 12/18/92
DATE EXTRACTED: NA
DATE ANALYZED: 12/29/92

SAMPLE ID: CEF-MP-SB-14 PROJ #07544.30

CERTIFICATION #: E84059
HRS84297

VOLATILE ORGANICS
METHOD 8010/8020 - GC

DRY WEIGHT (%): 81

Benzene	ND	1,4-Dichlorobenzene	ND
Benzyl chloride	ND	Dichlorodifluoromethane	ND
Bromobenzene	ND	1,1-Dichloroethane	ND
Bromodichloromethane	ND	1,2-Dichloroethane	ND
Bromoform	ND	1,1-Dichloroethylene	ND
Bromomethane	ND	cis-1,2-Dichloroethylene	ND
Carbon tetrachloride	ND	trans-1,2-Dichloroethylene	ND
Chlorobenzene	ND	Dichloromethane	190 B
Chloroethane	ND	1,2-Dichloropropane	ND
Chloroform	ND	trans-1,3-Dichloropropylene	ND
1-Chlorohexane	ND	Ethylbenzene	ND
2-Chloroethyl vinyl ether	ND	1,1,2,2-Tetrachloroethane	ND
Chloromethane	ND	1,1,1,2-Tetrachloroethane	ND
Chlorotoluene	ND	Tetrachloroethylene	ND
Dibromochloromethane	ND	Toluene	ND
Dibromomethane	ND	1,1,1-Trichloroethane	ND
1,2-Dichlorobenzene	ND	1,1,2-Trichloroethane	ND
1,3-Dichlorobenzene	ND	Trichloroethylene	ND

NOTE: ND (None Detected, lower detectable limit = 4 ug/kg) dry weight
ND* (None Detected, lower detectable limit = ug/kg) dry weight
-- (Not Analyzed)

WADSWORTH/ [illegible] Laboratories

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB #: 2L1804-8
MATRIX: SOIL

DATE RECEIVED: 12/18/92
DATE EXTRACTED: NA
DATE ANALYZED: 12/29/92

SAMPLE ID: CEF-MP-SB-14 PROJ #07544.30

CERTIFICATION #: E84059
HRS84297

VOLATILE ORGANICS
METHOD 8010/8020 - GC

Trichlorofluoromethane	ND
Trichloropropane	ND
Vinyl chloride	ND
Xylenes	ND
Methyl-tert-butylether	ND

NOTE: ND (None Detected, lower detectable limit = 4 ug/kg) dry weight
ND* (None Detected, lower detectable limit = ug/kg) dry weight
-- (Not Analyzed)

SURROGATE RECOVERY:	%	ACCEPTABLE LIMITS WATER	SOLID	LOW LEVEL
ɔmochloromethane (HECD)	121	(78-122)	(49-121)	(75-125)
Trifluorotoluene (PID)	85	(73-131)	(70-123)	(75-125)

WADSWORTH/ Laboratories

COMPANY : ABB ENVIRONMENTAL SERVICES, INC. DATE RECEIVED: 12/18/92
LAB #: 2L1804-8
MATRIX : SOIL

SAMPLE ID : CEF-MP-SB-14 PROJ #07544.30

CERTIFICATION #: E84059
HRS84297

METALS ANALYTICAL REPORT
SELECTED LIST

Total metals analysis results - dry weight basis

DRY WEIGHT (%): 81

ELEMENT	PREPARATION - ANALYSIS DATE	RESULT	DETECTION LIMIT	
Lead	12/21-12/22/92	ND	2.5	mg/kg

NOTE: ND (None Detected)

WADSWORTH/ [illegible]ERT Laboratories

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB #: 2L1804-9
MATRIX: SOIL

DATE RECEIVED: 12/18/92
DATE EXTRACTED: NA
DATE ANALYZED: 12/29/92

SAMPLE ID: DUP-1

PROJ #07544.30

CERTIFICATION #: E84059
HRS84297

VOLATILE ORGANICS
METHOD 8010/8020 - GC

DRY WEIGHT (%): 78

Benzene	ND	1,4-Dichlorobenzene	ND
Benzyl chloride	ND	Dichlorodifluoromethane	ND
Bromobenzene	ND	1,1-Dichloroethane	ND
Bromodichloromethane	ND	1,2-Dichloroethane	ND
Bromoform	ND	1,1-Dichloroethylene	ND
Bromomethane	ND	cis-1,2-Dichloroethylene	ND
Carbon tetrachloride	ND	trans-1,2-Dichloroethylene	ND
Chlorobenzene	ND	Dichloromethane	35 B
oroethane	ND	1,2-Dichloropropane	ND
Chloroform	ND	trans-1,3-Dichloropropylene	ND
1-Chlorohexane	ND	Ethylbenzene	ND
2-Chloroethyl vinyl ether	ND	1,1,2,2-Tetrachloroethane	ND
Chloromethane	ND	1,1,1,2-Tetrachloroethane	ND
Chlorotoluene	ND	Tetrachloroethylene	ND
Dibromochloromethane	ND	Toluene	ND
Dibromomethane	ND	1,1,1-Trichloroethane	ND
1,2-Dichlorobenzene	ND	1,1,2-Trichloroethane	ND
1,3-Dichlorobenzene	ND	Trichloroethylene	ND

NOTE: ND (None Detected, lower detectable limit = 2 ug/kg) as rec'd
ND* (None Detected, lower detectable limit = ug/kg) as rec'd
-- (Not Analyzed)

WADSWORTH/ [illegible] Laboratories

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB #: 2L1804-9
MATRIX: SOIL

DATE RECEIVED: 12/18/92
DATE EXTRACTED: NA
DATE ANALYZED: 12/29/92

SAMPLE ID: DUP-1

PROJ #07544.30

CERTIFICATION #: E84059
HRS84297

VOLATILE ORGANICS
METHOD 8010/8020 - GC

Trichlorofluoromethane	ND
Trichloropropane	ND
Vinyl chloride	ND
Xylenes	ND
Methyl-tert-butylether	ND

NOTE: ND (None Detected, lower detectable limit = 2 ug/kg) as rec'd
ND* (None Detected, lower detectable limit = ug/kg) as rec'd
-- (Not Analyzed)

SURROGATE RECOVERY:	%	ACCEPTABLE LIMITS WATER	SOLID	LOW LEVEL
Bromochloromethane (HECD)	101	(78-122)	(49-121)	(75-125)
Trifluorotoluene (PID)	91	(73-131)	(70-123)	(75-125)

WADSWORTH/ ALERT Laboratories

COMPANY : ABB ENVIRONMENTAL SERVICES, INC. DATE RECEIVED: 12/18/92
LAB #: 2L1804-9
MATRIX : SOIL

SAMPLE ID : DUP-1 PROJ #07544.30

CERTIFICATION #: E84059
HRS84297

METALS ANALYTICAL REPORT
SELECTED LIST

Total metals analysis results - dry weight basis

DRY WEIGHT (%): 78

ELEMENT	PREPARATION - ANALYSIS DATE	RESULT	DETECTION LIMIT	
Lead	12/21-12/22/92	ND	2.5	mg/kg

NOTE: ND (None Detected)

WADSWORTH/ Laboratories

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB # 2L1804-10
MATRIX: WATER

DATE RECEIVED: 12/18/92
DATE EXTRACTED: NA
DATE ANALYZED: 12/29/92

SAMPLE ID: TRIP BLANK PROJ #07544.30

CERTIFICATION #: E84059
HRS84297

VOLATILE ORGANICS
METHOD 601/602 - GC

Benzene	ND	1,2-Dichloroethane	ND
Bromodichloromethane	ND	1,1-Dichloroethene	ND
Bromoform	ND	1,2-Dichloroethene (Total)	ND
Bromomethane	ND	1,2-Dichloropropane	ND
Carbon tetrachloride	ND	cis-1,3-Dichloropropene	ND
Chlorobenzene	ND	trans-1,3-Dichloropropene	ND
Chloroethane	ND	Ethylbenzene	ND
2-Chloroethylvinyl ether	ND	Methylene chloride	ND
Chloroform	ND	1,1,2,2-Tetrachloroethane	ND
Chloromethane	ND	Tetrachloroethene	ND
Dibromochloromethane	ND	Toluene	ND
1,2-Dichlorobenzene	ND	1,1,1-Trichloroethane	ND
1,3-Dichlorobenzene	ND	1,1,2-Trichloroethane	ND
1,4-Dichlorobenzene	ND	Trichloroethene	ND
Dichlorodifluoromethane	ND	Trichlorofluoromethane	ND
1,1-Dichloroethane	ND	Vinyl chloride	ND
		Xylenes	ND
		Methyl-tert-butylether	ND

NOTE: ND (None Detected, lower detectable limit = 1 ug/L) as rec'd
ND* (None Detected, lower detectable limit = ug/L) as rec'd
-- (Not Analyzed)

SURROGATE RECOVERY:	%	ACCEPTABLE LIMITS
Bromochloromethane (HECD)	86	(78-122)
Trifluorotoluene (PID)	98	(73-131)

QUALITY CONTROL SECTION

- Quality Control Summary
- Laboratory Blanks
- Laboratory Control Sample
- Matrix Spike/Matrix Spike Duplicate Results
- Sample Custody Documentation

WADSWORTH/ ALERT Laboratories

QUALITY ASSURANCE / QUALITY CONTROL
PROGRAM SUMMARY

Wadsworth/ALERT Laboratories considers continuous analytical method performance evaluations to be an integral portion of the data package, and routinely includes the pertinent QA/QC data associated with various analytical result reports. Brief discussions of the various QA/QC procedures utilized to measure acceptable method and matrix performance follow.

Surrogate Spike Recovery Evaluations

Known concentrations of designated surrogate spikes, consisting of a number of similar, non-method compounds or method compound analogues, are added, as appropriate, to routine GC and GC/MS sample fractions prior to extraction and analysis. The percent recovery determinations calculated from the subsequent analysis is an indication of the overall method efficiency for the individual sample. This surrogate spike recovery data is displayed alongside acceptable analytical method performance limits at the bottom of each applicable analytical result report sheet.

NOTE: Acceptable method performance for Base/Neutral Acid extractables is indicated by two (2) of three (3) surrogates for each fraction with a minimum recovery of ten (10) percent each. For Pesticides one (1) of two (2) surrogates meeting performance criteria is acceptable.

Laboratory Analytical Method Blank Evaluations

Laboratory analytical method blanks are systematically prepared and analyzed in order to continuously evaluate the system interferences and background contamination levels associated with each analytical method. These method blanks include all aspects of actual laboratory method analysis (chemical reagents, glassware, etc.), substituting laboratory reagent water or solid for actual sample. The method blank must not contain any analytes above the reported detection limit. The following common laboratory contaminants are exceptions to this rule provided they are not present at greater than five times the detection limit.

Volatiles	Semi-volatiles	Metals
Methylene chloride	Dimethyl phthalate	Calcium
Toluene	Diethly phthalate	Magnesium
2-Butanone	Di-n-butyl phthalate	Sodium
Acetone	Butyl benzyl phthalate	
	Bis (2-ethylhexyl) phthalate	

A minimum of five percent (5%) of all laboratory analyses are laboratory analytical method blanks.

Laboratory Analytical Method Check Sample Evaluations

Known concentrations of designated matrix spikes (actual analytical method compounds) are added to a laboratory reagent blank prior to extraction and analysis. Percent recovery determinations demonstrate the performance of the analytical method. Failure of a check sample to meet established laboratory recovery criteria is cause to stop the analysis until the problem is resolved.

QUALITY ASSURANCE / QUALITY CONTROL
PROGRAM SUMMARY
(cont'd)

At that time all associated samples must be re-analyzed. A minimum of five percent (5%) of all laboratory analyses are laboratory analytical method check samples.

Matrix Spike (MS)/Matrix Spike Duplicate (MSD) Recovery Evaluations

Known concentrations of designated matrix spikes (actual analytical method compounds) are added to two of three separate aliquots of a sequentially predetermined sample prior to extraction and analysis. Percent recovery determinations are calculated from both of the spiked samples by comparison to the actual values generated from the unspiked sample. These percent recovery determinations indicate the accuracy of the analysis at recovering actual analytical method compounds from the matrix. Relative percent difference determinations calculated from a comparison of the MS/MSD recoveries demonstrate the precision of the analytical method. Actual percent recovery and relative percent difference data is displayed alongside their respective acceptable analytical method performance limits in the QA/QC section of the report. The MS/MSD are considered in control when the precision is within established control limits and the associated check sample has been found to be acceptable. A minimum of ten percent (10%) of all analyses are MS/MSD quality control samples.

**********EXAMPLE**********

COMPOUND	SAMPLE CONC.	MS %REC	MSD %REC	RPD	QC LIMITS RPD	QC LIMITS RECOVERY
4,4'-DDT	0	95	112	16	22	66-119
Benzene	10	86	93	8	20	39-150
(cmpd. name)	sample result	1st% recov.	2nd% recov.	Rel.% diff.	accep. method perform range	

Analytical Result Qualifiers

The following qualifiers, as defined below, may be appended to analytical results in order to allow proper interpretation of the results presented:

J - indicates an estimated concentration (typically used when a dilution, matrix interference or instrumental limitation prevents accurate quantitation of a particular analyte).

B - indicates the presence of a particular analyte in the laboratory blank analyzed concurrently with the samples. Results must be interpreted accordingly.

DIL - indicates that because of matrix interferences and/or high analyte concentrations, it was necessary to dilute the sample to a point where the surrogate or spike concentrations fell below a quantifiable amount and could not be reported.

WADSWORTH/ [illegible] Laboratories

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB # 2L1804-BK
MATRIX: WATER

DATE RECEIVED: 12/18/92
DATE EXTRACTED: NA
DATE ANALYZED: 12/29/92

SAMPLE ID: LABORATORY BLANK PROJ #07544.30

CERTIFICATION #: E84059
HRS84297

VOLATILE ORGANICS
METHOD 601/602 - GC

Benzene	ND	1,2-Dichloroethane	ND
Bromodichloromethane	ND	1,1-Dichloroethene	ND
Bromoform	ND	1,2-Dichloroethene (Total)	ND
Bromomethane	ND	1,2-Dichloropropane	ND
Carbon tetrachloride	ND	cis-1,3-Dichloropropene	ND
Chlorobenzene	ND	trans-1,3-Dichloropropene	ND
Chloroethane	ND	Ethylbenzene	ND
2-Chloroethylvinyl ether	ND	Methylene chloride	ND
Chloroform	ND	1,1,2,2-Tetrachloroethane	ND
Chloromethane	ND	Tetrachloroethene	ND
Dibromochloromethane	ND	Toluene	ND
1,2-Dichlorobenzene	ND	1,1,1-Trichloroethane	ND
1,3-Dichlorobenzene	ND	1,1,2-Trichloroethane	ND
1,4-Dichlorobenzene	ND	Trichloroethene	ND
Dichlorodifluoromethane	ND	Trichlorofluoromethane	ND
1,1-Dichloroethane	ND	Vinyl chloride	ND
		Xylenes	ND
		Methyl-tert-butylether	ND

NOTE: ND (None Detected, lower detectable limit = 1 ug/L) as rec'd
ND* (None Detected, lower detectable limit = ug/L) as rec'd
-- (Not Analyzed)

SURROGATE RECOVERY:	%	ACCEPTABLE LIMITS
Bromochloromethane (HECD)	85	(78-122)
Trifluorotoluene (PID)	98	(73-131)

WADSWORTH/ [illegible] Laboratories

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB #: 2L1804-BK
MATRIX: SOIL

DATE RECEIVED: 12/18/92
DATE EXTRACTED: NA
DATE ANALYZED: 12/28/92

SAMPLE ID: LABORATORY BLANK PROJ #07544.30

CERTIFICATION #: E84059
HRS84297

VOLATILE ORGANICS
METHOD 8010/8020 - GC

Benzene	ND	1,4-Dichlorobenzene	ND
Benzyl chloride	ND	Dichlorodifluoromethane	ND
Bromobenzene	ND	1,1-Dichloroethane	ND
Bromodichloromethane	ND	1,2-Dichloroethane	ND
Bromoform	ND	1,1-Dichloroethylene	ND
Bromomethane	ND	cis-1,2-Dichloroethylene	ND
Carbon tetrachloride	ND	trans-1,2-Dichloroethylene	ND
Chlorobenzene	ND	Dichloromethane	3
[illegible]oroethane	ND	1,2-Dichloropropane	ND
Chloroform	ND	trans-1,3-Dichloropropylene	ND
1-Chlorohexane	ND	Ethylbenzene	ND
2-Chloroethyl vinyl ether	ND	1,1,2,2-Tetrachloroethane	ND
Chloromethane	ND	1,1,1,2-Tetrachloroethane	ND
Chlorotoluene	ND	Tetrachloroethylene	ND
Dibromochloromethane	ND	Toluene	ND
Dibromomethane	ND	1,1,1-Trichloroethane	ND
1,2-Dichlorobenzene	ND	1,1,2-Trichloroethane	ND
1,3-Dichlorobenzene	ND	Trichloroethylene	ND

NOTE: ND (None Detected, lower detectable limit = 1 ug/L) as rec'd
ND* (None Detected, lower detectable limit = ug/L) as rec'd
-- (Not Analyzed)

WADSWORTH/ [illegible] Laboratories

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB #: 2L1804-BK
MATRIX: SOIL

DATE RECEIVED: 12/18/92
DATE EXTRACTED: NA
DATE ANALYZED: 12/28/92

SAMPLE ID: LABORATORY BLANK PROJ #07544.30

CERTIFICATION #: E84059
HRS84297

VOLATILE ORGANICS
METHOD 8010/8020 - GC

Trichlorofluoromethane	ND
Trichloropropane	ND
Vinyl chloride	ND
Xylenes	ND
Methyl-tert-butylether	ND

NOTE: ND (None Detected, lower detectable limit = 1 ug/L) as rec'd
ND* (None Detected, lower detectable limit = ug/L) as rec'd
-- (Not Analyzed)

SURROGATE RECOVERY:	%	ACCEPTABLE LIMITS WATER	SOLID	LOW LEVEL
Bromochloromethane (HECD)	97	(78-122)	(49-121)	(75-125)
Trifluorotoluene (PID)	93	(73-131)	(70-123)	(75-125)

WADSWORTH/ Laboratories

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB #: 2L1804-BK
MATRIX: SOIL

DATE RECEIVED: 12/18/92
DATE EXTRACTED: NA
DATE ANALYZED: 12/29/92

SAMPLE ID: LABORATORY BLANK PROJ #07544.30

CERTIFICATION #: E84059
HRS84297

VOLATILE ORGANICS
METHOD 8010/8020 - GC

Benzene	ND	1,4-Dichlorobenzene	ND
Benzyl chloride	ND	Dichlorodifluoromethane	ND
Bromobenzene	ND	1,1-Dichloroethane	ND
Bromodichloromethane	ND	1,2-Dichloroethane	ND
Bromoform	ND	1,1-Dichloroethylene	ND
Bromomethane	ND	cis-1,2-Dichloroethylene	ND
Carbon tetrachloride	ND	trans-1,2-Dichloroethylene	ND
Chlorobenzene	ND	Dichloromethane	2
oroethane	ND	1,2-Dichloropropane	ND
Chloroform	ND	trans-1,3-Dichloropropylene	ND
1-Chlorohexane	ND	Ethylbenzene	ND
2-Chloroethyl vinyl ether	ND	1,1,2,2-Tetrachloroethane	ND
Chloromethane	ND	1,1,1,2-Tetrachloroethane	ND
Chlorotoluene	ND	Tetrachloroethylene	ND
Dibromochloromethane	ND	Toluene	ND
Dibromomethane	ND	1,1,1-Trichloroethane	ND
1,2-Dichlorobenzene	ND	1,1,2-Trichloroethane	ND
1,3-Dichlorobenzene	ND	Trichloroethylene	ND

NOTE: ND (None Detected, lower detectable limit = 1 ug/L) as rec'd
ND* (None Detected, lower detectable limit = ug/L) as rec'd
-- (Not Analyzed)

WADSWORTH/ [illegible] Laboratories

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB #: 2L1804-BK
MATRIX: SOIL

DATE RECEIVED: 12/18/92
DATE EXTRACTED: NA
DATE ANALYZED: 12/29/92

SAMPLE ID: LABORATORY BLANK PROJ #07544.30

CERTIFICATION #: E84059
HRS84297

VOLATILE ORGANICS
METHOD 8010/8020 - GC

Trichlorofluoromethane	ND
Trichloropropane	ND
Vinyl chloride	ND
Xylenes	ND
Methyl-tert-butylether	ND

NOTE: ND (None Detected, lower detectable limit = 1 ug/L) as rec'd
ND* (None Detected, lower detectable limit = ug/L) as rec'd
-- (Not Analyzed)

SURROGATE RECOVERY:	%	ACCEPTABLE LIMITS WATER	SOLID	LOW LEVEL
Bromochloromethane (HECD)	96	(78-122)	(49-121)	(75-125)
Trifluorotoluene (PID)	91	(73-131)	(70-123)	(75-125)

WADSWORTH/ [illegible] Laboratories

COMPANY : ABB ENVIRONMENTAL SERVICES, INC. DATE RECEIVED: 12/18/92
LAB #: 2L1804-BK
MATRIX : WATER

SAMPLE ID : LABORATORY BLANK PROJ #07544.30

CERTIFICATION #: E84059

METALS ANALYTICAL REPORT HRS84297
SELECTED LIST

Total metals analysis results - as received

ELEMENT	PREPARATION - ANALYSIS DATE	RESULT	DETECTION LIMIT	
Chromium	12/23/92	ND	50	ug/L
Lead	12/23/92	ND	5	ug/L

NOTE: ND (None Detected)

WADSWORTH/ALERT Laboratories

COMPANY : ABB ENVIRONMENTAL SERVICES, INC.
LAB #: 2L1804-BK
MATRIX : WATER

DATE RECEIVED: 12/18/92

SAMPLE ID : LABORATORY BLANK PROJ #07544.30

CERTIFICATION #: E84059
HRS84297

METALS ANALYTICAL REPORT
SELECTED LIST

Dissolved metals analysis results

ELEMENT	PREPARATION - ANALYSIS DATE	RESULT	DETECTION LIMIT	
Chromium	12/21-12/22/92	ND	50	ug/L
Lead	12/21/92	ND	5	ug/L

NOTE: ND (None Detected) as rec'd

WADSWORTH/ Laboratories

COMPANY : ABB ENVIRONMENTAL SERVICES, INC. DATE RECEIVED: 12/18/92
LAB #: 2L1804-BK
MATRIX : SOIL

SAMPLE ID : LABORATORY BLANK PROJ #07544.30

CERTIFICATION #: E84059
HRS84297

METALS ANALYTICAL REPORT
SELECTED LIST

Total metals analysis results - as received

ELEMENT	PREPARATION - ANALYSIS DATE	RESULT	DETECTION LIMIT	
Lead	12/21-12/22/92	ND	0.05	mg/L

NOTE: ND (None Detected)

WADSWORTH/ [illegible] Laboratories

LAB ID : LCS
MATRIX : WATER
METHOD : 601/2
RUN ID : 1A/1B2906

DATE EXTRACTED: NA
DATE ANALYZED : 12/28/92

DUPLICATE LABORATORY CONTROL SAMPLE RESULTS

COMPOUND	ANALYTICAL RUN ID #	LCS %REC	LCSD %REC	RPD	QC LIMITS RPD	QC LIMITS %REC
Benzene	1A/1B2906	99	99	0	15	70-117
Toluene		99	99	0	16	70-117
Chlorobenzene		97	97	0	24	58-133
1,1-Dichloroethene		92	77	18	28	43-131
Trichloroethene		106	94	12	13	75-1[illegible]
Dichlorobromomethane		93	85	9	22	61-1[illegible]

WADSWORTH/ ALERT Laboratories

LAB ID : LCS
MATRIX : SOIL
METHOD : 8010/20
RUN ID : SA/SB02907

DATE EXTRACTED: N/A
DATE ANALYZED : 12/28/92

DUPLICATE LABORATORY CONTROL SAMPLE RESULTS

COMPOUND	ANALYTICAL RUN ID #	LCS %REC	LCSD %REC	RPD	QC LIMITS RPD	QC LIMITS %REC
Benzene	SA/SB02907	91	99	8	21	71-114
Toluene		94	99	5	17	77-112
Chlorobenzene		92	97	5	19	74-114
1,1-Dichloroethene		86	109	24	30	45-137
Trichloroethene		106	94	12	28	64-121
Dichlorobromomethane		89	87	2	31	65-127

WADSWORTH/ [illegible] Laboratories

LAB ID : LCS
MATRIX : SOIL
METHOD : 8010/20
RUN ID : SA/SB02926A

DATE EXTRACTED: N/A
DATE ANALYZED : 12/29/92

DUPLICATE LABORATORY CONTROL SAMPLE RESULTS

COMPOUND	ANALYTICAL RUN ID #	LCS %REC	LCSD %REC	RPD	QC LIMITS RPD	QC LIMITS %REC
Benzene	SA/SB02926A	100	97	3	21	71-114
Toluene		101	96	5	17	77-112
Chlorobenzene		97	93	4	19	74-114
1,1-Dichloroethene		93	97	4	30	45-137
Trichloroethene		100	96	4	28	64-12[illegible]
Dichlorobromomethane		118	111	6	31	65-1[illegible]

WADSWORTH/ Laboratories

LAB ID : LCS MATRIX : WATER

LABORATORY CONTROL SAMPLE RESULTS
METALS

ELEMENT	DATE PREPARED	DATE ANALYZED	LCS %REC	QC LIMITS RPD	QC LIMITS %REC	
Chromium	12/21/92	12/22/92	104	21	79-121	LCS
Lead (furnace)	12/21/92	12/21/92	100	33	64-132	

WADSWORTH/ Laboratories

LAB ID : LCS MATRIX : WATER

LABORATORY CONTROL SAMPLE RESULTS
METALS

ELEMENT	DATE PREPARED	DATE ANALYZED	LCS %REC	QC LIMITS RPD	QC LIMITS %REC	
Chromium	12/23/92	12/23/92	101	21	79-121	LCS
Lead (furnace)	12/23/92	12/23/92	99	33	64-132	

WADSWORTH/ [illegible] Laboratories

LAB ID : LCS MATRIX : SOIL

LABORATORY CONTROL SAMPLE RESULTS
METALS

ELEMENT	DATE PREPARED	DATE ANALYZED	LCS %REC	QC LIMITS RPD	QC LIMITS %REC	
Lead	12/21/92	12/22/92	85	35	58-130	LCS

WADSWORTH/ [illegible] Laboratories

LAB ID : 2L1804-8
MATRIX : SOIL
METHOD : 8010/20
RUN ID : SA/SB02926

DATE RECEIVED : 12/18/92
DATE PREPARED : N/A
DATE ANALYZED : 12/29/92

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

COMPOUND	ANALYTICAL RUN ID #	MS %REC	MSD %REC	RPD	QC LIMITS RPD	QC LIMITS %REC
Benzene	SA/SB02926	99	106	7	21	71-114
Toluene		98	109	11	12	84-128
Chlorobenzene		93	100	7	19	74-114
1,1-Dichloroethene		147	150	2	30	45-137
Trichloroethene		101	105	4	28	64-121
Dichlorobromomethane		113	119	5	31	65-127

* = Diluted Out

WADSWORTH/ Laboratories

LAB ID : 2L1804-2
MATRIX : WATER

DATE RECEIVED : 12/18/92

MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY
INORGANIC PARAMETERS - METALS

ELEMENT	DATE PREPARED	DATE ANALYZED	MS %REC	MSD %REC	RPD	QC LIMITS RPD	QC LIMITS %REC	LAB ID
Chromium	12/23/92	12/23/92	87	89	2	21	74-117	2L1804-2
Lead (furnace)	12/23/92	12/23/92	100	97	3	24	76-124	

* = Diluted out

WADSWORTH/ Laboratories

LAB ID : 2L1804-7 DATE RECEIVED : 12/18/92
MATRIX : WATER

MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY
INORGANIC PARAMETERS - METALS

ELEMENT	DATE PREPARED	DATE ANALYZED	MS %REC	MSD %REC	RPD	QC LIMITS RPD	QC LIMITS %REC	LAB ID
Chromium	12/21/92	12/22/92	103	105	2	21	74-117	2L1804-7
Lead (furnace)	12/21/92	12/21/92	111	106	5	24	76-124	

* = Diluted out

WADSWORTH/ [illegible] Laboratories

LAB ID : 2L1804-8 DATE RECEIVED : 12/18/92
MATRIX : SOIL

MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY
INORGANIC PARAMETERS - METALS

ELEMENT	DATE PREPARED	DATE ANALYZED	MS %REC	MSD %REC	RPD	QC LIMITS RPD	QC LIMITS %REC	LAB ID
Lead	12/21/92	12/22/92	94	96	2	34	65-135	2L1804-8

* = Diluted out

WADSWORTH/ALERT LABORATORIES
Sampling, testing, mobile labs

5910 Breckenridge Pkwy.
Suite H
Tampa, FL 33610

(813) 621-0784
Fax (813) 623-6021

Chain of Custody Record

Record _____ of _____

09840

Client:	Project Name / Location	No. Of CON-TAINERS	Parameter										Remarks
Sampler(s)	Project #:		VOC –	PAH –	METALS –	TRPH –	EDB –						

Item #	Date	Time	MATRIX	Sample Location
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				

Total Containers

Number of Coolers in Shipment: 1

Bailers

Report To:

Additional Comments:

Transfer Number	Item Number(s)	Relinquished By / Company	Accepted By / Company	Date	Time
1					
2					
3					
4					
5					
6					

Original Accompanies Shipment

WADSWORTH/ALERT LABORATORIES
SAMPLE SHIPPER EVALUATION AND RECEIPT FORM

07544.30

Client: ABB Project Name/Number: Cecil FLD Morton

Samples Received By: Zach Butler Date Received: 12/18/92
(Signature)

Sample Evaluation Form By: Zach Butler LAB No: 2L1804-1 to 18
(Signature)

Type of shipping container samples received in? WAL Cooler ✓

Client Cooler ____ WAL Shipper ____ Box ____ Other ____

Any "NO" responses or discrepancies should be explained in comments section.

		YES	NO
1.	Were custody seals on shipping container(s) intact?	✓	
2.	Were custody papers properly included with samples?	✓	
3.	Were custody papers properly filled out (ink, signed, match labels)?	✓	
4.	Did all bottles arrive in good condition (unbroken)?	✓	
5.	Were all bottle labels complete (Sample No., date, signed, analysis preservatives)?	✓	
6.	Were correct bottles used for the tests indicated?	✓	
7.	Were proper sample preservation techniques indicated?	✓	
8.	Were samples received within adequate holding time?	✓	
9.	Were all VOA bottles checked for the presence of air bubbles? (If air bubbles were found indicate in comment section)	✓	
10.	Were samples in direct contact with wet ice? (NOTE TEMPERATURE BELOW)	✓	
11.	Were samples accepted into the laboratory? (If no see comments)	✓	

Cooler # 117 Temp 3 °C Cooler # ____ Temp ____ °C

Cooler # ____ Temp ____ °C Cooler # ____ Temp ____ °C

Comments: ____

WADSWORTH/ [illegible] Laboratories
Division of Enseco Incorporated

5910 Breckenridge Parkway, Suite H
Tampa, FL 33610

813-621-0784
FAX 813-623-6021

January 6, 1993

Ms. Nicole Pagano
ABB Environmental Services, Inc.
2590 Executive Center Circle East
Tallahassee, FL 32301

Dear Ms. Pagano:

As you requested in our telephone conversation on 5 January 1993, enclosed with this letter is some additional data to be added to the Cecil Field Motor Pool project which was received by our laboratory 18 December 1992. The following explanation should describe the background behind the data you originally received as well as the data package provided with this letter.

As you know, Methylene Chloride is a common laboratory contaminant due to its extensive use as an extraction solvent for semi - volatile organic contaminants as regulated by the EPA. Normally, the levels detected as background in a laboratory are not significant. Our laboratory recently had a roof repair job during which time the workmen disconnected and incorrectly reconnected several of our exhaust system motors and ducts. The problem became evident when we began to see significant amounts of Methylene Chloride showing up across all samples indicating a laboratory contamination problem. I have determined from looking at the analysis run logs and data from samples analyzed before and after the samples in question (2L1804-8, 2L1804-9) that a high transient level of Methylene Chloride was present during the analysis of these samples,even though the laboratory blanks associated with these samples have much lower background levels of Methylene Chloride. Laboratory blanks and control samples are analyzed early in the day before the extractions group has begun a lot of extraction work. After the laboratory blanks are analyzed, the autosamplers are prepared to run throughout the day and into the evening when the levels of Methylene Chloride have a tendency to increase in the ambient air. This was the case on both days that these samples were analyzed since their actual analytical analysis time was several hours after the last laboratory blank and before the next laboratory blank.

At the discretion of one of our analysts, a second analysis was performed on sample number 2L1804-8 (which had the highest level of Methylene Chloride) before the EPA recommended holding time had been exceeded. The purpose of this analysis was to verify that the Methylene Chloride detected originally was in fact a high transient level due to the laboratory. The Methylene Chloride level in the second analysis was significantly lower confirming the conclusion that the original values for 2L1804-8 and 2L1804-9 should be considered suspect due to laboratory background contamination. The data from this second analysis along with its associated Laboratory Blank and Laboratory Control Sample is enclosed with this letter.

Ms. Nicole Pagano

January 6, 1993

The current status of the laboratory is that the problems associated with the re-roofing have been corrected and background levels of the Methylene Chloride appear to be decreasing down to routine manageable levels. To verify this, we are actively conducting special monitoring programs for Methylene Chloride.

Should you have any more questions, or need further assistance regarding this or other matters, please do not hesitate to contact either Dan Henson or myself at (813) 621-0784.

Sincerely,

Enseco-Wadsworth/ALERT Laboratories

N. Myron Gunsalus, Jr.
Regional Quality Assurance Director

NMG/bj

Enclosures

c: Steve Packard
Dan Henson

WADSWORTH/ ALERT Laboratories
Division of Enseco Incorporated

5910 Breckenridge Parkway, Suite H
Tampa, FL 33610

813-621-0784
FAX 813-623-6021

ANALYTICAL REPORT

SUBCONTRACT NUMBER: 1-08-134

CECIL FIELD MOTOR POOL

Presented to:

PETER REDFERN

ABB ENVIRONMENTAL SERVICES, INC.

ENSECO-WADSWORTH/ALERT LABORATORIES

5910 BRECKENRIDGE PARKWAY, SUITE H

TAMPA, FL 33610

(813) 621-0784

Dan Henson
Project Manager

Randall C. Grubbs
Laboratory Director - Florida

January 6, 1993

WADSWORTH/ [illegible] Laboratories

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB #: 2L1804-8
MATRIX: SOIL

DATE RECEIVED: 12/18/92
DATE EXTRACTED: NA
DATE ANALYZED: 12/31/92

SAMPLE ID: CEF-MP-SB-14 PROJ #07544.30

CERTIFICATION #: E84059
HRS84297

VOLATILE ORGANICS
METHOD 8010/8020 - GC

DRY WEIGHT (%): 81

Benzene	ND	1,4-Dichlorobenzene	ND
Benzyl chloride	ND	Dichlorodifluoromethane	ND
Bromobenzene	ND	1,1-Dichloroethane	ND
Bromodichloromethane	ND	1,2-Dichloroethane	ND
Bromoform	ND	1,1-Dichloroethylene	ND
Bromomethane	ND	cis-1,2-Dichloroethylene	ND
Carbon tetrachloride	ND	trans-1,2-Dichloroethylene	ND
Chlorobenzene	ND	Dichloromethane	10 B
[illegible]oroethane	ND	1,2-Dichloropropane	ND
Chloroform	ND	trans-1,3-Dichloropropylene	ND
1-Chlorohexane	ND	Ethylbenzene	ND
2-Chloroethyl vinyl ether	ND	1,1,2,2-Tetrachloroethane	ND
Chloromethane	ND	1,1,1,2-Tetrachloroethane	ND
Chlorotoluene	ND	Tetrachloroethylene	ND
Dibromochloromethane	ND	Toluene	ND
Dibromomethane	ND	1,1,1-Trichloroethane	ND
1,2-Dichlorobenzene	ND	1,1,2-Trichloroethane	ND
1,3-Dichlorobenzene	ND	Trichloroethylene	ND

NOTE: ND (None Detected, lower detectable limit = 7 ug/kg) dry weight
ND* (None Detected, lower detectable limit = ug/kg) dry weight
-- (Not Analyzed)

WADSWORTH/ Laboratories

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB #: 2L1804-8
MATRIX: SOIL

DATE RECEIVED: 12/18/92
DATE EXTRACTED: NA
DATE ANALYZED: 12/31/92

SAMPLE ID: CEF-MP-SB-14 PROJ #07544.30

CERTIFICATION #: E84059
HRS84297

VOLATILE ORGANICS
METHOD 8010/8020 - GC

Trichlorofluoromethane	ND
Trichloropropane	ND
Vinyl chloride	ND
Xylenes	ND
Methyl-tert-butylether	ND

NOTE: ND (None Detected, lower detectable limit = 7 ug/kg) dry weight
ND* (None Detected, lower detectable limit = ug/kg) dry weight
-- (Not Analyzed)

SURROGATE RECOVERY:	%	ACCEPTABLE LIMITS WATER	SOLID	LOW LEVEL
Bromochloromethane (HECD)	124	(78-122)	(49-121)	(75-125)
Trifluorotoluene (PID)	91	(73-131)	(70-123)	(75-125)

WADSWORTH/ [illegible] Laboratories

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB #: 2L1804-BK
MATRIX: WATER

DATE RECEIVED: 12/18/92
DATE EXTRACTED: NA
DATE ANALYZED: 12/31/92

SAMPLE ID: LABORATORY BLANK PROJ #07544.30

CERTIFICATION #: E84059
HRS84297

VOLATILE ORGANICS
METHOD 8010/8020 - GC

Benzene	ND	1,4-Dichlorobenzene	ND
Benzyl chloride	ND	Dichlorodifluoromethane	ND
Bromobenzene	ND	1,1-Dichloroethane	ND
Bromodichloromethane	ND	1,2-Dichloroethane	ND
Bromoform	ND	1,1-Dichloroethylene	ND
Bromomethane	ND	cis-1,2-Dichloroethylene	ND
Carbon tetrachloride	ND	trans-1,2-Dichloroethylene	ND
Chlorobenzene	ND	Dichloromethane	3
loroethane	ND	1,2-Dichloropropane	ND
Chloroform	ND	trans-1,3-Dichloropropylene	ND
1-Chlorohexane	ND	Ethylbenzene	ND
2-Chloroethyl vinyl ether	ND	1,1,2,2-Tetrachloroethane	ND
Chloromethane	ND	1,1,1,2-Tetrachloroethane	ND
Chlorotoluene	ND	Tetrachloroethylene	ND
Dibromochloromethane	ND	Toluene	ND
Dibromomethane	ND	1,1,1-Trichloroethane	ND
1,2-Dichlorobenzene	ND	1,1,2-Trichloroethane	ND
1,3-Dichlorobenzene	ND	Trichloroethylene	ND

NOTE: ND (None Detected, lower detectable limit = 1 ug/L) as rec'd
ND* (None Detected, lower detectable limit = ug/L) as rec'd
-- (Not Analyzed)

WADSWORTH/ ABT Laboratories

COMPANY: ABB ENVIRONMENTAL SERVICES, INC.
LAB #: 2L1804-BK
MATRIX: WATER

DATE RECEIVED: 12/18/92
DATE EXTRACTED: NA
DATE ANALYZED: 12/31/92

SAMPLE ID: LABORATORY BLANK PROJ #07544.30

CERTIFICATION #: E84059
HRS84297

VOLATILE ORGANICS
METHOD 8010/8020 - GC

Trichlorofluoromethane	ND
Trichloropropane	ND
Vinyl chloride	ND
Xylenes	ND
Methyl-tert-butylether	ND

NOTE: ND (None Detected, lower detectable limit = 1 ug/L) as rec'd
ND* (None Detected, lower detectable limit = ug/L) as rec'd
-- (Not Analyzed)

SURROGATE RECOVERY:	%	ACCEPTABLE LIMITS WATER	SOLID	LOW LEVEL
Bromochloromethane (HECD)	96	(78-122)	(49-121)	(75-125)
Trifluorotoluene (PID)	93	(73-131)	(70-123)	(75-125)

WADSWORTH/ ALERT Laboratories

LAB ID : LCS
MATRIX : SOIL
METHOD : 8010/20
RUN ID : SA/SB03091

DATE EXTRACTED: N/A
DATE ANALYZED : 12/31/92

DUPLICATE LABORATORY CONTROL SAMPLE RESULTS

COMPOUND	ANALYTICAL RUN ID #	LCS %REC	LCSD %REC	RPD	QC LIMITS RPD	QC LIMITS %REC
Benzene	SA/SB03091	102	104	2	21	71-114
Toluene		101	103	2	17	77-112
Chlorobenzene		98	102	4	19	74-114
1,1-Dichloroethene		104	85	20	30	45-137
Trichloroethene		97	100	3	28	64-121
Dichlorobromomethane		94	113	18	31	65-127

APPENDIX D

Precision Test

ACUTEST

November 3, 1989

Mr. Ken Busen
C.E. Environmental
E.C. Jordon
2571 Executive Center E.
Suite 100
Tallahassee, FL 32301

Test No. : 891021
Test Date : October 21, 1989
Location : Public Works & Transportation
Bldg. 80
Cecil Field
Jacksonville, FL

Dear Mr Busen:

A precision test was performed on tanks at the above location using the LEAK COMPUTER® System. We have reviewed the data produced in conjunction with this test for purposes of verifying the results and certifying the tank systems. The testing was performed in accordance with AcuTest protocol, and therefore satisfies all requirements for such testing as set forth by NFPA 329-87 and USEPA 40 CFR part 280.

The results of testing are shown on the following page, and indicate whether the full systems, including the tank and all nonpressurized piping, or just the individual tank passed or failed. Included with the report are computer printouts of the data compiled during the last hour of each test. Each printout shows leak rate, and the confidence level (three times standard deviation) of that leak rate. This information is stored in a permanent file if future verification of test results is needed.

QUALITY ASSURANCE BY:

Robert G. McKinney
T/A #004

TEST CERTIFIED BY:

D. G. Van Delinder
A/T #049

DGV:smc\17

Test No. : 891021
Test Date : October 21, 1989
Location : Public Works & Transportation
Bldg. 80
Cecil Field
Jacksonville, FL

TEST RESULTS

PRODUCT	VOLUME (GAL)	WATER IN TANK (INCHES)	HIGH LEVEL LEAK RATE (GPH)	LOW LEVEL LEAK RATE (GPH)	FULL SYSTEM	TANK ONLY
REGULAR	10,000	2″	0.22 @ 50″	0.01 @ 33″	FAIL	PASS
UNLEADED	5,076	0	0.00 @ 30″	0.00 @ 14″	PASS	PASS

SUCTION PRODUCT LINE TEST

REGULAR : Tight to a level of 33″ above tank top.
UNLEADED : Tight to a level of 30″ above tank top.

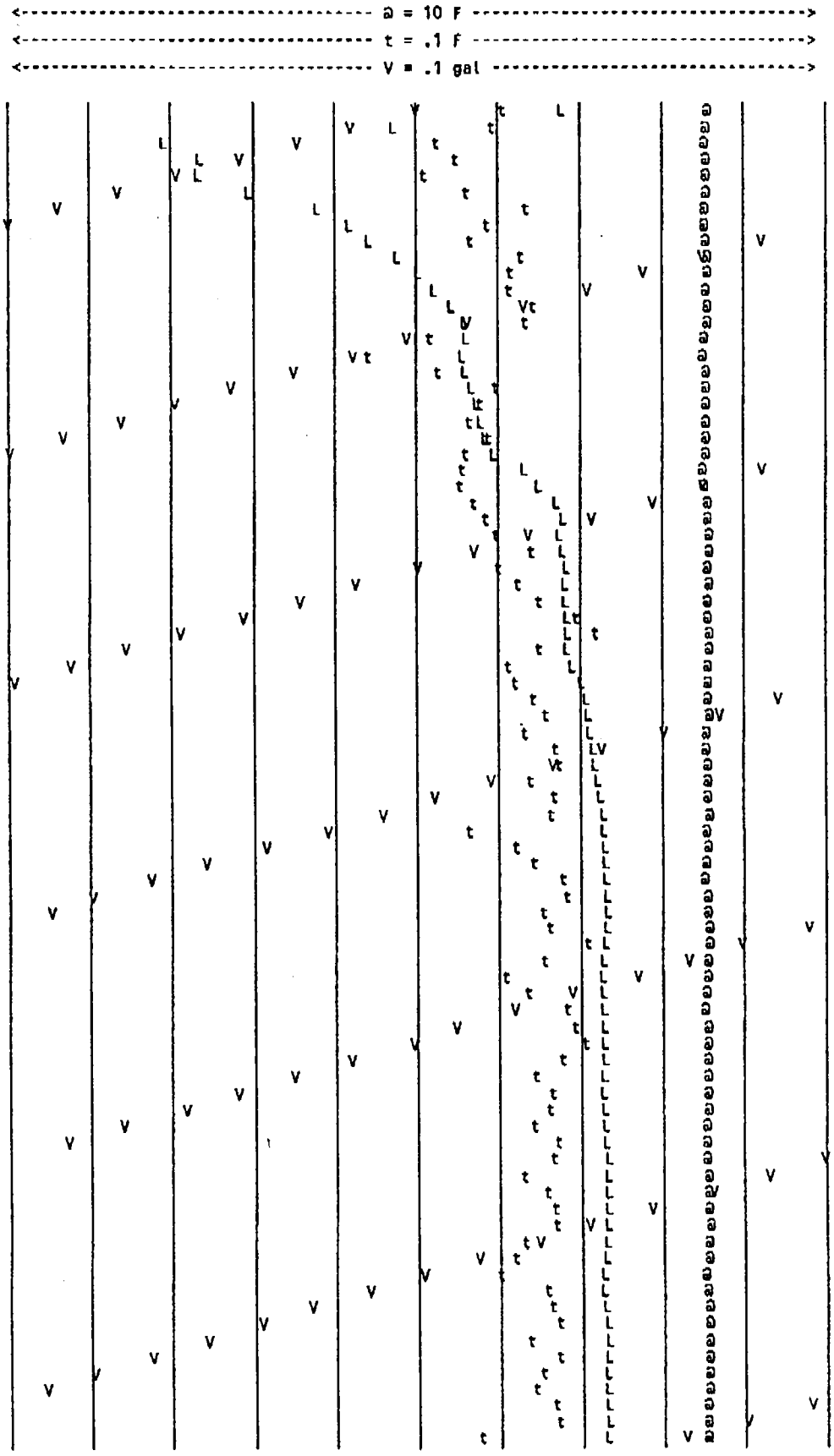
LEAK HEIGHT ANALYSIS

The REGULAR tank system has a piping leak located between 33″ and 50″ above tank top.

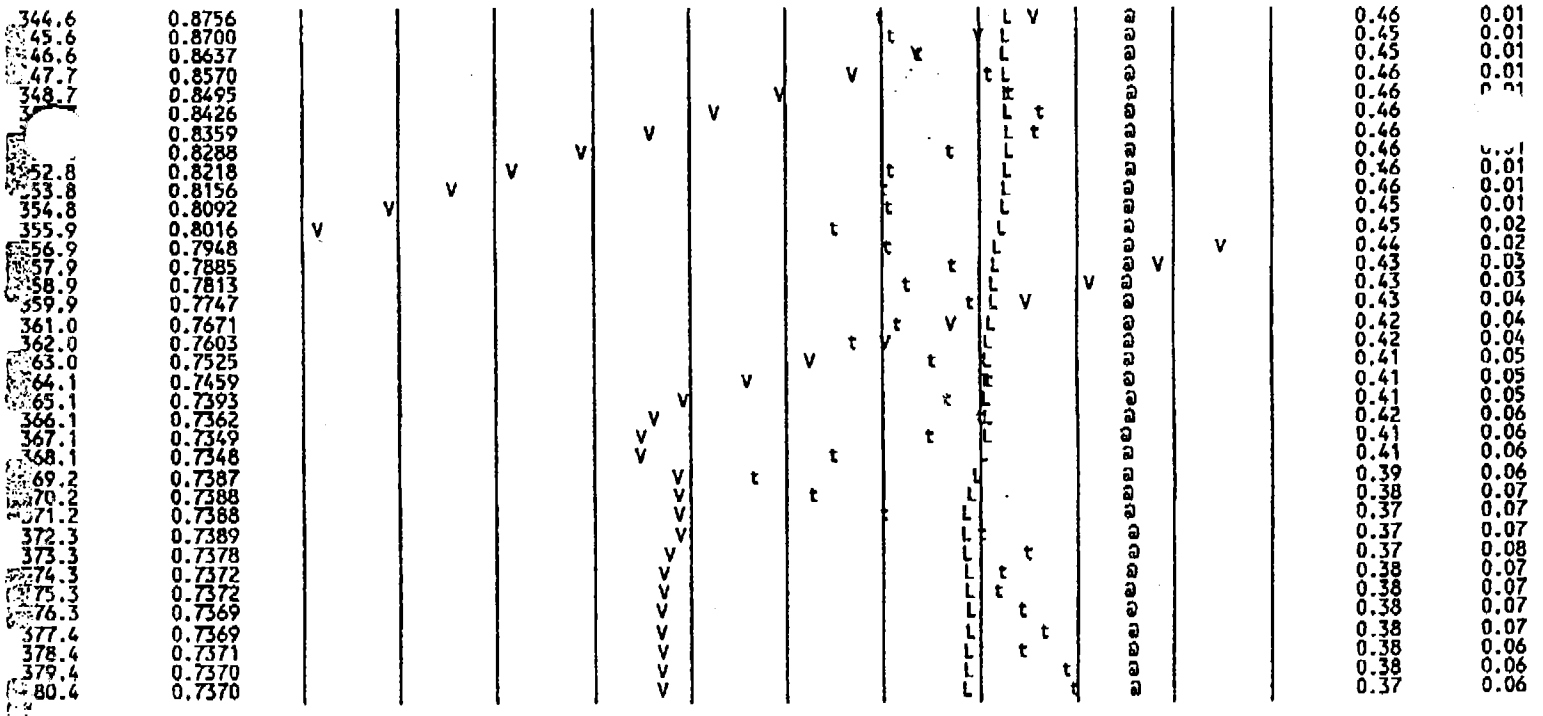
CHART FOR DATA RECORD: 89102166.A50 OF 10000 GALLON REG. TANK @ CECIL FIELD N.S. BLD. 80 CECIL FL.

ERATOR: CLARK/MOREY

EAK RATE AVG OF 20 CYCLES / LINE FEED: 6 IPH / TOTAL TEST TIME: 254.6 MIN / DENSITY: .74 / TANK TEMP @ START: 79 F / COE: .000686



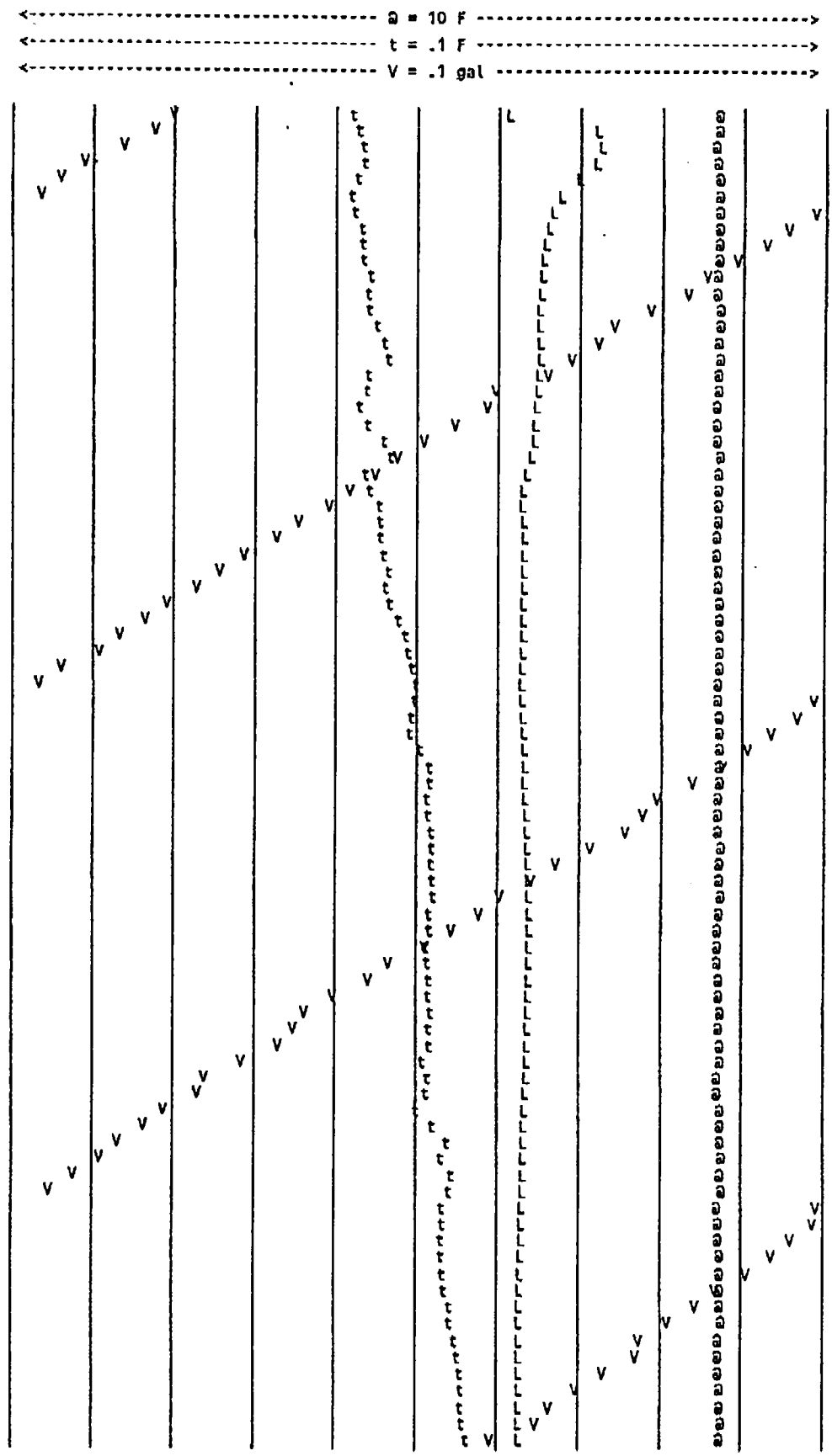
TIME	GALLONS	AVG LEAK RATE	THREE STD DEV
260.8	1.4500	0.36	0.05
261.9	1.4420	-0.05	9.99
262.9	1.4354	-0.62	1.19
263.9	1.4284	-0.53	0.91
264.9	1.4208	-0.53	0.77
266.0	1.4135	-0.41	0.66
267.0	1.4061	-0.24	0.64
268.0	1.4000	-0.16	0.64
269.0	1.3923	-0.12	0.65
270.0	1.3850	-0.05	0.67
271.0	1.3777	0.00	0.70
272.1	1.3709	0.05	0.72
273.1	1.3631	0.09	0.74
274.1	1.3563	0.12	0.76
275.1	1.3488	0.12	0.77
276.2	1.3423	0.11	0.78
277.2	1.3350	0.12	0.78
278.2	1.3273	0.14	0.78
279.2	1.3205	0.15	0.78
280.3	1.3139	0.16	0.78
281.3	1.3067	0.17	0.77
282.3	1.3002	0.19	0.79
283.3	1.2923	0.26	0.72
284.3	1.2850	0.30	0.65
285.4	1.2788	0.34	0.56
286.4	1.2714	0.36	0.48
287.4	1.2637	0.35	0.44
288.4	1.2571	0.36	0.41
289.4	1.2502	0.37	0.38
290.4	1.2426	0.36	0.36
	1.2357	0.36	0.34
	1.2287	0.37	0.33
293.4	1.2212	0.37	0.33
294.5	1.2145	0.37	0.32
295.6	1.2077	0.38	0.31
296.6	1.2007	0.40	0.30
297.6	1.1942	0.41	0.28
298.6	1.1871	0.42	0.26
299.7	1.1801	0.42	0.24
300.7	1.1725	0.43	0.21
301.7	1.1666	0.44	0.18
302.7	1.1591	0.44	0.14
303.7	1.1522	0.45	0.12
304.8	1.1458	0.46	0.11
305.8	1.1391	0.46	0.11
306.8	1.1315	0.46	0.12
307.8	1.1242	0.46	0.11
308.8	1.1175	0.46	0.11
309.9	1.1102	0.46	0.11
310.9	1.1051	0.46	0.11
311.9	1.0980	0.46	0.10
312.9	1.0898	0.46	0.10
314.0	1.0832	0.46	0.09
315.0	1.0769	0.45	0.07
316.0	1.0689	0.45	0.06
317.0	1.0619	0.46	0.05
318.1	1.0548	0.46	0.04
319.1	1.0496	0.46	0.04
320.1	1.0419	0.46	0.03
321.1	1.0348	0.46	0.02
322.2	1.0280	0.46	0.02
323.2	1.0217	0.46	0.01
324.2	1.0141	0.46	0.01
325.2	1.0072	0.46	0.01
326.2	0.9999	0.47	0.01
327.3	0.9931	0.47	0.01
328.3	0.9862	0.47	0.01
329.3	0.9786	0.47	0.01
330.3	0.9710	0.46	0.01
331.4	0.9649	0.46	0.01
332.4	0.9574	0.46	0.01
333.4	0.9507	0.45	0.01
	0.9441	0.45	0.01
	0.9370	0.46	0.01
336.4	0.9309	0.46	0.01
337.5	0.9244	0.47	0.01
338.5	0.9176	0.46	0.01
339.5	0.9104	0.46	0.01
340.5	0.9045	0.46	0.01
341.5	0.8982	0.46	0.01
342.6	0.8904	0.47	0.01
343.6	0.8827	0.46	0.01



344.6	0.8756	0.46	0.01
345.6	0.8700	0.45	0.01
346.6	0.8637	0.45	0.01
347.7	0.8570	0.46	0.01
348.7	0.8495	0.46	0.01
	0.8426	0.46	
	0.8359	0.46	
	0.8288	0.46	
352.8	0.8218	0.46	0.01
353.8	0.8156	0.46	0.01
354.8	0.8092	0.45	0.01
355.9	0.8016	0.45	0.02
356.9	0.7948	0.44	0.02
357.9	0.7885	0.43	0.03
358.9	0.7813	0.43	0.03
359.9	0.7747	0.43	0.04
361.0	0.7671	0.42	0.04
362.0	0.7603	0.42	0.04
363.0	0.7525	0.41	0.05
364.1	0.7459	0.41	0.05
365.1	0.7393	0.41	0.05
366.1	0.7362	0.42	0.06
367.1	0.7349	0.41	0.06
368.1	0.7348	0.41	0.06
369.2	0.7387	0.39	0.06
370.2	0.7388	0.38	0.07
371.2	0.7388	0.37	0.07
372.3	0.7389	0.37	0.07
373.3	0.7378	0.37	0.08
374.3	0.7372	0.38	0.07
375.3	0.7372	0.38	0.07
376.3	0.7369	0.38	0.07
377.4	0.7369	0.38	0.07
378.4	0.7371	0.38	0.06
379.4	0.7370	0.38	0.06
380.4	0.7370	0.37	0.06

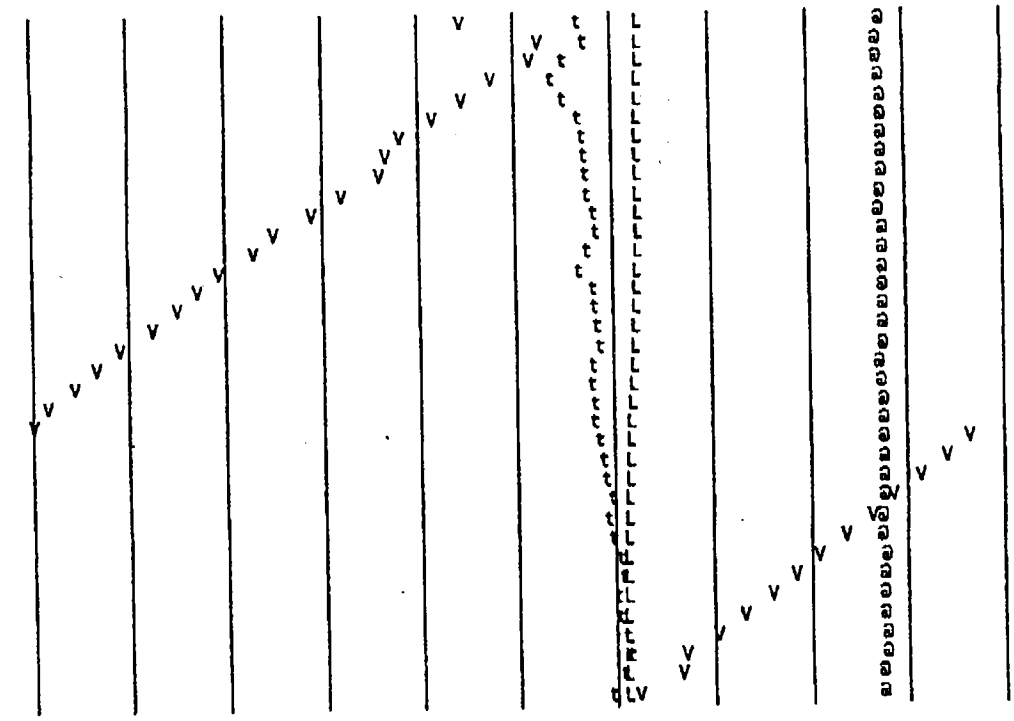
END OF STRIP CHART 89102166.A50 DATA COLLECTED ON LEAK COMPUTER S/N 87081307

HART FOR DATA RECORD: 89102167.A50 OF 10000 GALLON REG. TANK @ CECIL FIELD N.S. BLD. 80 CECIL FL.
ERATOR: CLARK/MOREY
AK RATE AVG OF 20 CYCLES / LINE FEED: 6 IPH / TOTAL TEST TIME: 444.8 MIN / DENSITY: .74 / TANK TEMP @ START: 79 F / COE: .000686



TIME	GALLONS	AVG LEAK RATE	THREE STD DEV
722.8	3.4199	0.23	0.01
723.8	3.4177	0.44	9.99
724.8	3.4138	0.45	0.02
725.8	3.4090	0.44	0.02
726.8	3.4060	0.40	0.07
727.9	3.4036	0.36	0.12
728.9	3.3988	0.33	0.15
729.9	3.3955	0.33	0.16
730.9	3.3928	0.32	0.17
731.9	3.3893	0.31	0.18
732.9	3.3855	0.31	0.18
734.0	3.3832	0.31	0.18
735.0	3.3786	0.30	0.18
736.0	3.3742	0.30	0.18
737.1	3.3722	0.30	0.17
738.1	3.3690	0.30	0.17
739.1	3.3661	0.30	0.17
740.1	3.3597	0.30	0.17
741.1	3.3587	0.29	0.17
742.2	3.3546	0.29	0.16
743.2	3.3509	0.29	0.16
744.2	3.3476	0.28	0.15
745.3	3.3449	0.27	0.12
746.3	3.3417	0.26	0.09
747.3	3.3392	0.26	0.07
748.3	3.3354	0.27	0.06
749.3	3.3327	0.27	0.06
750.4	3.3287	0.27	0.06
751.4	3.3257	0.27	0.05
	3.3229	0.27	0.05
	3.3192	0.26	0.05
	3.3165	0.26	0.05
755.4	3.3133	0.26	0.05
756.5	3.3108	0.26	0.05
757.5	3.3060	0.26	0.05
758.5	3.3033	0.26	0.04
759.5	3.2988	0.26	0.04
760.6	3.2968	0.26	0.03
761.6	3.2936	0.26	0.03
762.6	3.2907	0.27	0.02
763.7	3.2876	0.27	0.02
764.7	3.2839	0.27	0.01
765.7	3.2795	0.27	0.01
766.7	3.2777	0.27	0.01
767.8	3.2756	0.27	0.01
768.8	3.2713	0.27	0.01
769.8	3.2671	0.28	0.01
770.8	3.2641	0.28	0.02
771.8	3.2603	0.28	0.02
772.9	3.2577	0.28	0.02
773.9	3.2543	0.28	0.02
774.9	3.2510	0.28	0.02
775.9	3.2466	0.28	0.02
777.0	3.2442	0.28	0.02
778.0	3.2398	0.28	0.02
779.0	3.2362	0.28	0.02
780.0	3.2348	0.28	0.02
781.1	3.2329	0.28	0.01
782.1	3.2284	0.27	0.01
783.1	3.2238	0.27	0.01
784.1	3.2231	0.27	0.01
785.2	3.2189	0.27	0.01
786.2	3.2164	0.27	0.01
787.2	3.2131	0.27	0.01
788.2	3.2110	0.27	0.01
789.3	3.2076	0.26	0.02
790.3	3.2046	0.26	0.02
791.3	3.1991	0.26	0.02
792.3	3.1987	0.26	0.02
793.3	3.1961	0.26	0.02
794.3	3.1937	0.26	0.02
795.4	3.1907	0.26	0.02
	3.1868	0.26	0.02
	3.1843	0.26	0.02
798.4	3.1809	0.26	0.02
799.5	3.1773	0.25	0.02
800.5	3.1769	0.25	0.02
801.5	3.1729	0.26	0.02
802.5	3.1696	0.26	0.02
803.6	3.1664	0.25	0.02
804.6	3.1647	0.25	0.01
805.6	3.1592	0.26	0.01

806.6	3.1445	0.26	0.01
807.7	3.1525	0.26	0.01
808.7	3.1517	0.26	0.01
809.7	3.1477	0.25	0.01
810.8	3.1446	0.25	0.01
811.8	3.1415	0.25	0.01
[illegible]	3.1381	0.25	[illegible]
[illegible]	3.1366	0.25	[illegible]
[illegible]	3.1359	0.25	[illegible]
815.9	3.1320	0.25	0.00
816.9	3.1289	0.25	0.00
817.9	3.1250	0.25	0.00
818.9	3.1230	0.25	0.01
820.0	3.1194	0.25	0.01
821.0	3.1172	0.25	0.01
822.0	3.1151	0.25	0.01
823.0	3.1125	0.25	0.01
824.1	3.1091	0.24	0.01
825.1	3.1066	0.24	0.01
826.1	3.1043	0.24	0.02
827.1	3.1016	0.24	0.02
828.1	3.1000	0.23	0.02
829.1	3.0964	0.23	0.02
830.2	3.0942	0.23	0.02
831.2	3.0914	0.23	0.02
832.2	3.0885	0.23	0.03
833.3	3.0863	0.23	0.03
834.3	3.0836	0.23	0.03
835.3	3.0808	0.23	0.03
836.3	3.0784	0.23	0.03
837.3	3.0760	0.23	0.03
838.4	3.0732	0.23	0.03
839.4	3.0704	0.23	0.03
840.4	3.0671	0.23	0.02
841.4	3.0667	0.23	0.02
842.5	3.0623	0.22	0.02

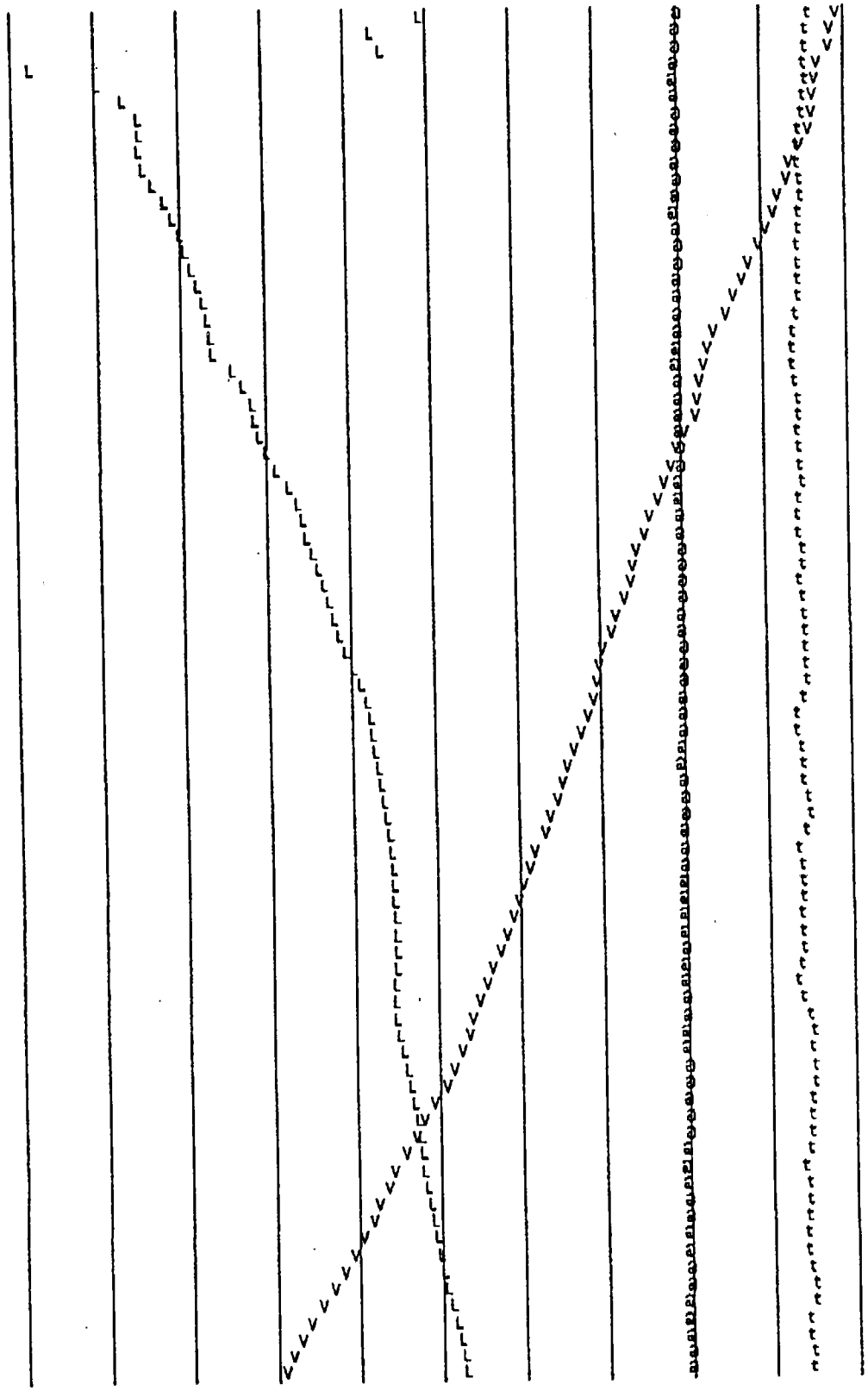


END OF STRIP CHART 89102167.A50 DATA COLLECTED ON LEAK COMPUTER S/N 87081307

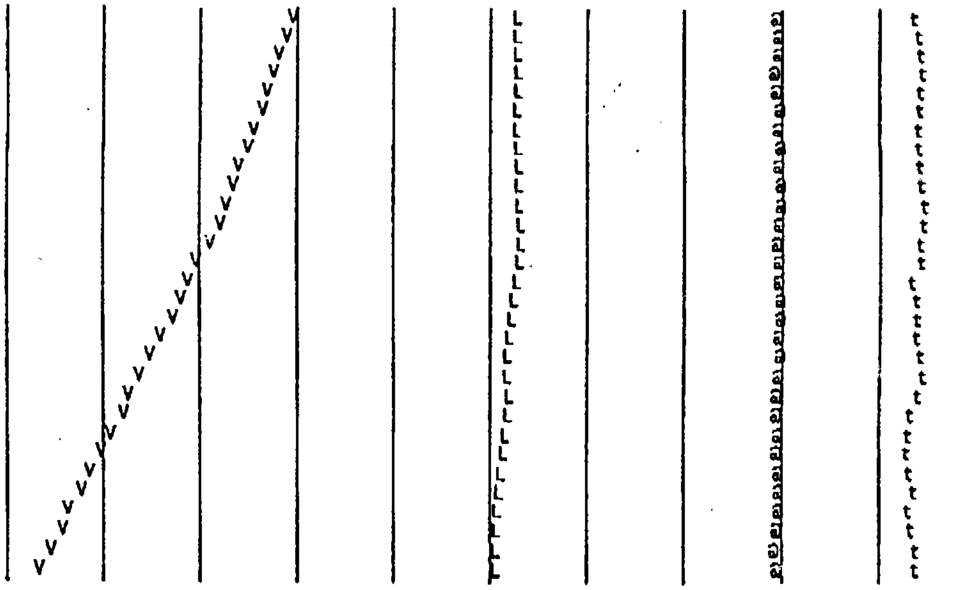
S... HART FOR DATA RECORD: 89102164.A33 OF 10000 GALLON REG. TANK @ CECIL FIELD N.S. BLD. 80 CECIL FL.

...ERATOR: CLARK/MOREY

...AK RATE AVG OF 20 CYCLES / LINE FEED: 6 IPH / TOTAL TEST TIME: 186 MIN / DENSITY: .73 / TANK TEMP @ START: 79 F / COE: .000686



TIME	GALLONS	AVG LEAK RATE	THREE STD DEV
...94.8	2.9991	-0.01	0.09
...95.8	2.9984	-1.32	9.99
...96.9	2.9983	-1.08	0.51
1397.9	2.9968	-0.95	0.56
1398.9	2.9966	-0.79	0.67
...99.9	2.9963	-0.73	0.71
...01.0	2.9962	-0.70	0.73
...02.0	2.9958	-0.69	0.72
1403.0	2.9947	-0.69	0.70
1404.1	2.9934	-0.69	0.68
1405.1	2.9931	-0.66	0.66
...06.1	2.9920	-0.63	0.65
...07.1	2.9915	-0.62	0.65
...08.1	2.9905	-0.60	0.64
1409.1	2.9897	-0.59	0.63
1410.2	2.9884	-0.57	0.63
...11.2	2.9876	-0.56	0.63
...12.2	2.9866	-0.54	0.62
...13.3	2.9856	-0.53	0.62
...14.3	2.9841	-0.53	0.62
1415.3	2.9833	-0.52	0.61
1416.3	2.9829	-0.48	0.45
...17.3	2.9823	-0.45	0.35
...18.4	2.9821	-0.43	0.29
...19.4	2.9819	-0.43	0.28
...20.4	2.9805	-0.41	0.28
1421.4	2.9795	-0.40	0.29
1422.5	2.9788	-0.37	0.29
...5	2.9780	-0.35	0.30
	2.9772	-0.32	0.30
	2.9762	-0.31	0.30
142...	2.9755	-0.30	0.30
1427.8	2.9745	-0.29	0.31
1428.6	2.9741	-0.28	0.31
...29.6	2.9738	-0.26	0.31
...30.6	2.9730	-0.25	0.31
...31.7	2.9720	-0.24	0.31
1432.7	2.9714	-0.23	0.30
1433.7	2.9703	-0.21	0.30
...34.7	2.9699	-0.19	0.29
...35.7	2.9695	-0.18	0.27
...36.8	2.9692	-0.16	0.27
1437.8	2.9685	-0.15	0.27
1438.8	2.9676	-0.15	0.26
1439.8	2.9667	-0.14	0.25
0.9	2.9659	-0.14	0.24
1.9	2.9653	-0.13	0.23
2.9	2.9647	-0.12	0.22
3.9	2.9637	-0.12	0.21
4.9	2.9632	-0.11	0.20
6.0	2.9618	-0.11	0.19
7.0	2.9612	-0.10	0.18
8.0	2.9604	-0.10	0.17
9.0	2.9598	-0.10	0.16
10.0	2.9592	-0.10	0.15
11.1	2.9583	-0.10	0.13
12.1	2.9575	-0.10	0.12
13.1	2.9565	-0.10	0.10
14.1	2.9558	-0.10	0.09
15.1	2.9549	-0.10	0.07
16.2	2.9541	-0.10	0.06
17.2	2.9537	-0.09	0.06
18.2	2.9527	-0.08	0.05
19.3	2.9518	-0.07	0.05
20.3	2.9509	-0.07	0.05
21.3	2.9494	-0.06	0.05
22.3	2.9480	-0.05	0.06
23.3	2.9471	-0.05	0.06
24.3	2.9458	-0.04	0.07
25.4	2.9444	-0.04	0.07
...6.4	2.9437	-0.03	0.08
	2.9425	-0.02	0.08
	2.9418	-0.02	0.09
	2.9405	-0.01	0.10
30.4	2.9394	-0.00	0.10
31.5	2.9382	0.00	0.11
32.5	2.9370	0.01	0.11
33.5	2.9355	0.02	0.12
34.6	2.9340	0.04	0.12
35.6	2.9328	0.04	0.13
36.6	2.9318	0.05	0.13
37.6	2.9309	0.06	0.13



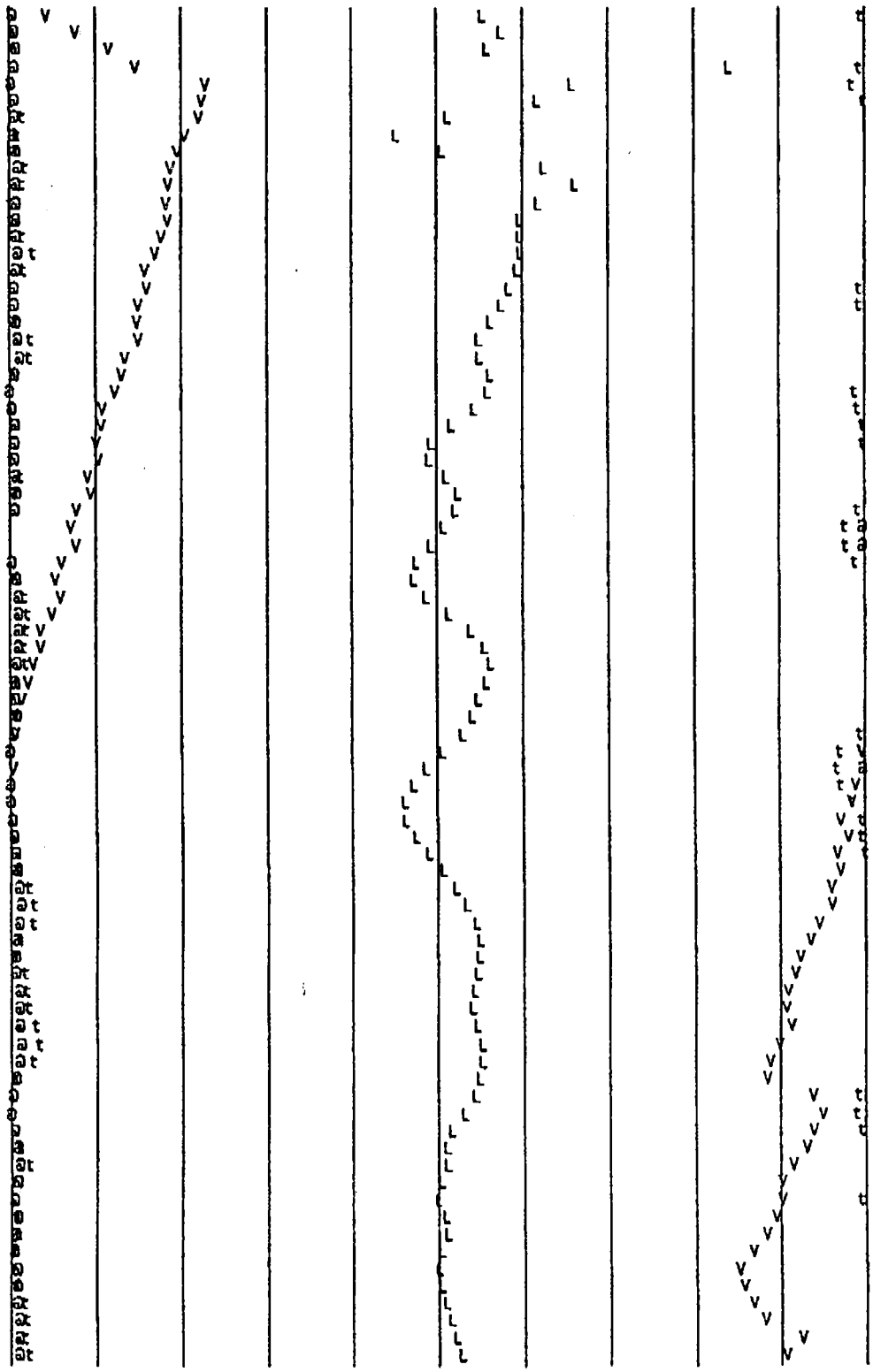
38.7	2.9295	0.06	0.13
39.7	2.9289	0.06	0.13
40.7	2.9281	0.06	0.12
41.7	2.9276	0.06	0.12
42.7	2.9269	0.06	0.12
43.7	2.9265	0.06	[illegible]
[illegible]	2.9255	0.06	[illegible]
[illegible]	2.9250	0.06	[illegible]
[illegible]	2.9240	0.06	[illegible]
47.8	2.9235	0.06	0.08
48.9	2.9228	0.06	0.07
49.9	2.9222	0.06	0.06
50.9	2.9212	0.06	0.05
51.9	2.9197	0.06	0.04
53.0	2.9189	0.06	0.03
54.0	2.9182	0.05	0.02
55.0	2.9173	0.05	0.02
56.0	2.9160	0.04	0.02
57.0	2.9149	0.04	0.02
58.1	2.9137	0.04	0.03
59.1	2.9126	0.04	0.03
60.1	2.9121	0.04	0.03
61.2	2.9108	0.03	0.03
62.1	2.9098	0.03	0.04
63.2	2.9086	0.02	0.04
64.2	2.9077	0.02	0.04
65.2	2.9062	0.01	0.05
66.2	2.9057	0.01	0.05
67.3	2.9045	0.01	0.05
68.3	2.9033	0.01	0.05

END OF STRIP CHART 89102164.A33 DATA COLLECTED ON LEAK COMPUTER S/N 87081307

CHART FOR DATA RECORD: 89102165.830 OF 5076 GALLON UNL. TANK @ CECIL FIELD N.S. BLD. 80 CECIL FL.

ERATOR: CLARK/MOREY

EAK RATE AVG OF 5 CYCLES / LINE FEED: 6 IPH / TOTAL TEST TIME: 955.2 MIN / DENSITY: .75 / TANK TEMP @ START: 80 F / COE: .000672



TIME	GALLONS	AVG LEAK RATE	THREE STD DEV
702.3	4.7042	0.11	0.07
703.3	4.7077	1.50	9.99
704.3	4.7116	1.17	0.69
705.4	4.7147	0.68	1.24
706.4	4.7228	0.32	1.57
707.4	4.7224	0.23	1.64
708.4	4.7220	0.03	1.36
709.5	4.7205	-0.09	0.90
710.5	4.7196	0.01	0.51
711.5	4.7188	0.25	0.45
712.5	4.7186	0.32	0.53
713.6	4.7183	0.24	0.53
714.6	4.7185	0.19	0.35
715.6	4.7177	0.19	0.16
716.6	4.7170	0.20	0.17
717.6	4.7158	0.19	0.06
718.7	4.7160	0.17	0.03
719.7	4.7150	0.15	0.06
720.7	4.7148	0.13	0.09
721.7	4.7150	0.10	0.11
722.8	4.7135	0.10	0.09
723.8	4.7130	0.12	0.07
724.8	4.7122	0.12	0.04
725.8	4.7108	0.09	0.05
726.8	4.7107	0.04	0.11
727.9	4.7101	-0.01	0.17
728.9	4.7104	-0.02	0.18
729.9	4.7091	0.02	0.13
730.9	4.7094	0.05	0.09
731.9	4.7077	0.04	0.09
	4.7070	0.02	0.08
	4.7077	-0.01	0.08
	4.7060	-0.05	0.12
736.0	4.7052	-0.05	0.12
737.1	4.7059	-0.02	0.08
738.1	4.7049	0.03	0.10
739.1	4.7035	0.08	0.17
740.1	4.7035	0.11	0.20
741.1	4.7026	0.12	0.18
742.2	4.7021	0.11	0.12
743.2	4.7013	0.10	0.05
744.2	4.7006	0.08	0.05
745.3	4.7006	0.06	0.08
746.3	4.6997	0.01	0.12
747.3	4.7003	-0.03	0.15
748.3	4.6990	-0.05	0.17
749.3	4.6985	-0.07	0.16
750.4	4.6972	-0.07	0.11
751.4	4.6980	-0.05	0.06
752.4	4.6968	-0.02	0.07
753.4	4.6972	0.01	0.11
754.4	4.6961	0.04	0.14
755.4	4.6961	0.07	0.14
756.5	4.6946	0.09	0.13
757.5	4.6936	0.10	0.10
758.5	4.6924	0.10	0.07
759.5	4.6918	0.09	0.04
760.6	4.6909	0.09	0.02
761.6	4.6907	0.08	0.02
762.6	4.6914	0.09	0.02
763.7	4.6899	0.10	0.03
764.7	4.6888	0.10	0.03
765.7	4.6884	0.10	0.03
766.7	4.6939	0.09	0.02
767.8	4.6950	0.06	0.05
768.8	4.6940	0.03	0.09
769.8	4.6931	0.02	0.10
770.8	4.6915	0.02	0.09
771.8	4.6902	0.01	0.06
772.9	4.6902	0.00	0.04
773.9	4.6895	0.02	0.03
774.9	4.6884	0.02	0.03
	4.6867	0.01	0.03
	4.6851	0.00	0.03
	4.6857	0.01	0.03
779.0	4.6868	0.02	0.03
780.0	4.6881	0.03	0.03
781.1	4.6926	0.04	0.05
782.1	4.6907	0.05	0.05